ASSESSMENT OF THE MEANS OF COMMUNICATIONS IN RELATION TO EASTERN CANADA OFFSHORE EXPLORATORY DRILLING

FINAL REPORT

DSS FILE NO. 11SC COMM. SYSTEMS

Submitted to: Royal Commission on Ocean Ranger Marine Disaster

Submitted by: NORDCO Limited

File Ref.: 202-83G

Date: July, 1984

ASSESSMENT OF THE MEANS OF COMMUNICATIONS IN RELATION TO EASTERN CANADA OFFSHORE EXPLORATORY DRILLING

FINAL REPORT

DSS FILE NO. 11SC COMM. SYSTEMS

Submitted to: Royal Commission on Ocean Ranger Marine Disaster

Submitted by: NORDCO Limited

File Ref.: 202-83G

Date: July, 1984

CAUTIONARY NOTE

This report is the property of the Royal Commission on the Ocean Ranger Marine Disaster. The contents of this report are confidential and should be treated as such. Reproduction by any means, in whole or in part, is not permitted without the written consent of the Royal Commission. The opinions, conclusions, and recommendations are those of the authors. Acceptance of this report by the Royal Commission is for contractual purposes only and should not be construed as acceptance of any of the opinions, conclusions, and recommendations contained herein.

ACKNOWLEDGEMENT

NORDCO would like to thank oil companies, offshore service industry, and government agencies or departments, in particular Canadian Coast Guard for their help in providing useful information on the communications systems operating in the study area.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF FIGURES (Con't)

LIST OF TABLES

LIST OF TABLES (Con't)

TABLE OF CONTENTS (Con't)

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This study undertaken for the Royal Commission on the "Ocean Ranger" Marine Disaster describes and assesses the means of communications in relation to Eastern Canada offshore drilling. In terms of communications aspects, it is convenient to divide the present activities into three zones based on the distance offshore; coastal (80 km), middle (80 to 350 km), and far (greater than 350 km). As examples, drilling off Sable Island on the Scotian Shelf can be included in the coastal zone while the Hibernia location would be in the middle zone. Two basic types of drilling units are currently in use; fixed, such as jack-ups used in shallow waters, or non-fixed, such as drill ships and semi-submersibles.

A drilling unit needs to maintain long and frequent communications contact with its shore-base. The type of communications services needed and provided on a drilling unit include, voice, telex, or teletype, telecopier or facsimile, and data. Both the drilling unit and its shore-base also need to be capable of voice communications with transport helicopter and support vessels. The ship, shore, and helicopter stations are required to meet a fairly comprehensive and detailed set of regulations under Canadian, International and other national conventions.

All the drilling units currently in operation in the study area have satellite communications terminals (mostly linked to INMARSAT), which provide voice, telex, facsimile, and data communication services. Satellite communications facilities are being used even though there are no regulations which make them mandatory. These terminals, through geostationary space satellites, provide a highly reliable link to the shore-base. The satellite terminals are equipped with an emergency override channel which provides immediate and automatic access to shore when activated. However, due to the present satellite user costs, the prime communications among the components of a 'drilling system' are basically provided by MF/HF and/or VHF links.

Of the two links, the VHF link is more reliable but is only effective up to ranges of approximately 80 km. This then is the primary link for line-of-sight distances and is used as such in the coastal exploration zone. The MF/HF links utilize ground and/or sky wave mode of propagation. The ground wave mode is more reliable than the sky wave mode but its effective range is up to approximately 350 km. The ground-wave mode then is prevalent for drilling operations in the middle exploration zone while the sky wave MF/HF mode is relevant to the far zone.

The inherent reliability of the above links may get degraded in practice or operations due to the occurence of severe environmental conditions. Adverse conditions such as lighting, rain or snow, and wind storms as well as the presence of sea ice may affect quality of communications and reduce usable range. As a result of these conditions, a particular communication link may fail, significantly degrading communicatons reliability. The VHF links suffer the least while the MF ground-wave propagation links may be severely affected during wind storms. The HF sky-wave links further suffer from variations in the ionospheric conditions which may introduce significant noise during night and thus degrade communications reliability.

The communications link with the helicopter is primarily provided by the VHF aeronautic band while the prime link with the support vessels is provided through the VHF marine band. Both helicopter and support vessels carry MF/HF equipment as well. These links perhaps are somewhat weaker than those between the drilling unit and the shore-base because the later are reinforced by the satellite link. All the above links have multi-channel capability, thus providing transmission/reception frequency redundancy. The communication equipment used on individual "drilling system" components (drilling unit, shore-base, support vessel, and transport vessel) consists of redundants or back-up equipment. In particular, on drilling units and shore bases, multiple antennas and receivers and spare transmitters

are provided, with automatic selection and switchover capability. Adequate back-up or emergency power is provided through lead acid batteries.

Although any two components of two nearby networks do not seem to share a common private frequency, they can easily talk to each other through a number of frequencies provided on the VHF, MF, and HF bands for public correspondence. Moreover, calling frequencies (e.g., international distress at 2182 kHz and those assigned to individual coast Guard stations) may be used to establish a common working frequency for temporary use through an intermediatory coast guard station. These stations are required to maintain a continuous listening watch on international distress and calling frequencies (500 kHz - telegraph under SOLAS, 2182 kHz, and 156.8 MHz). Most of the ship stations are also required to maintain this watch.

The offshore communications in the study area at present appears to be adequate to meet the needs of the exploration companies as well as being reasonably reliable to practical standards. This reliability could be enhanced through the following:

i) By clarifying the applicability of Canadian regulations to offshore drilling units (especially those foreign owned) and by clarifying apparently conflicting requirements,

ii) By requiring all transport helicopters to be equipped with VHF marine band radio equipment and/or for all support vessels to carry VHF aeronautic band radio equipment (former may be more practical),

iii) By requiring all drilling units, at least those operating at distances greater than approximately 80 km offshore (perhaps outside the VHF coverage area of the Coast Guard Station), to be equipped with satellite communication terminals,

iv) By requiring frequent preventative maintenance schedules for communications equipment and by requiring installation of performance monitoring and display devices,

v) By requiring spare communications equipment parts on drilling units and the services of a qualified electronics technician,

vi) By frequent communications checks (night and day) with Canadian Coast Guard Radio Stations in the area of operation using main and back-up equipment,

vii) By periodic emergency communications exercises,

viii) By requiring a communications contingency plan,

ix) By encouraging exploration operators to pool resources and thus, provide optimized antenna facilities at the shore for communications to a particular offshore region and,

x) By compiling communication reliability data base for the study area and encouraging research into improving MF/HF, and VHF communications reliability through improved antenna designs and employment of space, path, frequency, and polarization diversity.

1.0 INTRODUCTION

1.1 General

This study was commissioned by the Royal Commission on the Ocean Ranger Marine Disaster (RCORMD) to assess the means for communications in relation to the Eastern Canada offshore exploratory drilling. Safe offshore operations require reliable means of communications between various components of a "drilling system"; namely, the drill unit, shore-base(s), support vessel(s), and transport helicopter(s). Fail-safe means are needed for communicating emergency or distress signals between two points and for transmitting and receiving one or more information types - voice, data or text, and video.

A simplified illustration of the various links as the parts of an external communications network associated with a "drilling system" is shown in Figure 1. The communications link between two components or points is provided through propagation of electromagnetic waves or energy. (The information to be conveyed, e.g., voice, is converted into electromagnetic energy, i.e. radio waves, which are transmitted and upon reception converted back into the original form, e.g., voice). The frequencies or frequency-bands in the electromagnetic spectrum (e.g. Medium (MF), High (HF), and Very High Frequencies (VHF),Microwaves, etc.) employed for communicating between two points on the earth's surface are determined by a number of factors which include the existence of a direct or line-of-sight path, the intervening distance, and the environmental conditions. The use of the electromagnetic frequency spectrum is controlled under Canadian and International Regulations.

Two points may be joined directly by a connecting cable, or, for line-of-sight distances, for example, through microwaves or VHF. The communications link for over-the-horizon distances (i.e., beyond the line-of-sight) is primarily provided through MF and HF bands. Two points at a distance apart greater than the line-of-sight may be connected through an intermediate relay station, such as a space satellite, which provides a reliable direct, or line-of-sight, link to

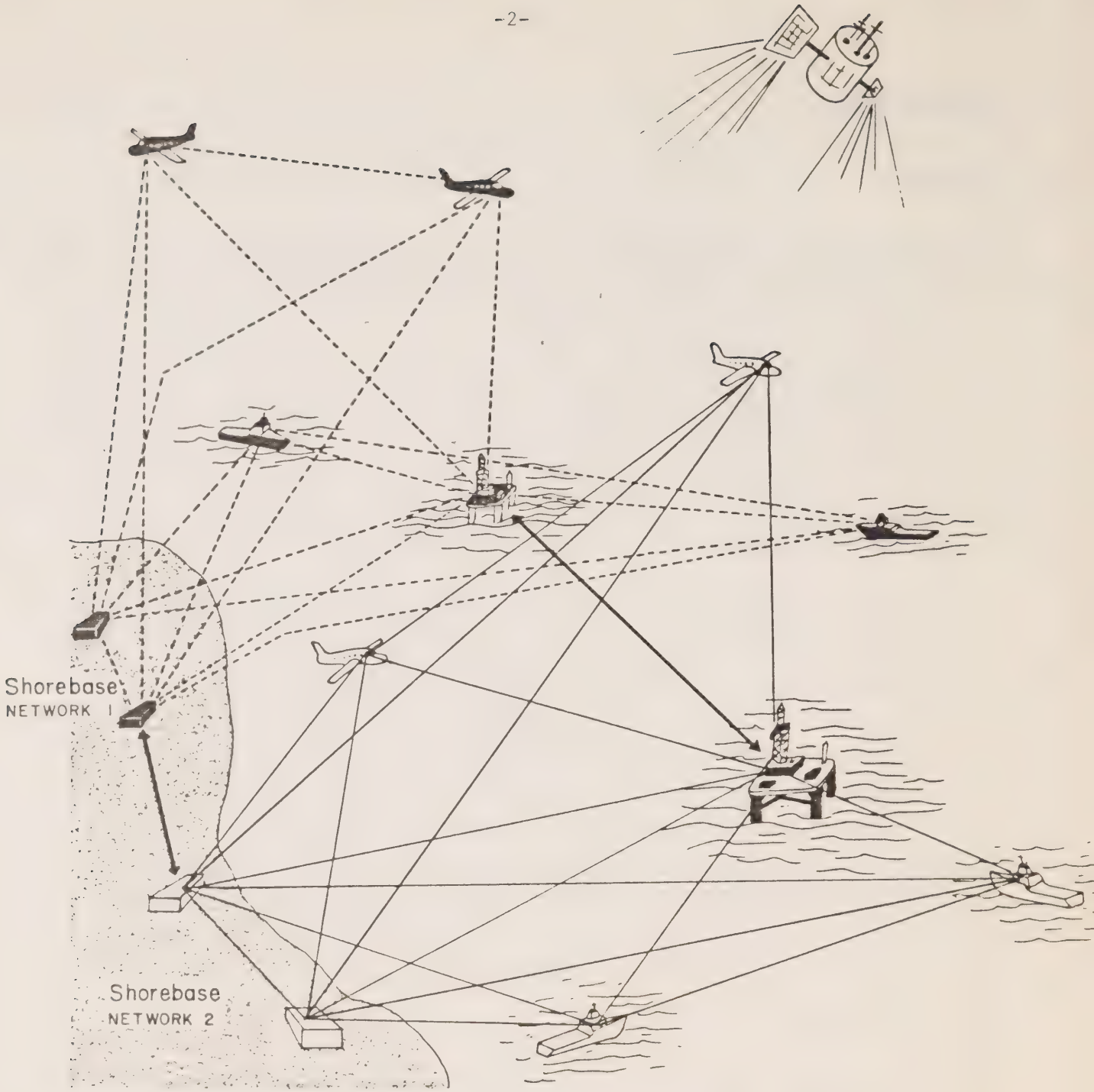


FIGURE 1 : Simplified Representation of Offshore Drilling Communications Networks.

each point. For this reason, satellites are finding an increasing role and importance in communications. Any two points at a distance greater than the line of sight may also be connected through reliable microwave or VHF terrestrial repeaters, each operating on a line-of-sight segment.

Accordingly, there may be one or more communication links (e.g., VHF,HF, etc.) between two components of a "drilling system" and each link may be operable at more than one channel or frequency. A drill unit, as part of the total communications network, has the external links connected to its internal communications system usually through one primary node (normally the radio operator console). Two nearby networks may be joined through inter-connections of major components, as illustrated in Figure 1.

This report describes and examines the relevant means of communication associated with a "drilling system" in accordance with the terms of reference of the study which are given in Appendix A and outlined below.

1.2 Terms of Reference

The Terms of Reference of the Royal Commission on the Ocean Ranger Marine Disaster call for a broad-ranging study plan, pertaining to offshore drilling and related activities, which includes five areas: environment, regulation, design, safety, and training. The geographic area for these studies (Figure 2) extends from the shore-line to the limit of jurisdictional claims, and from the Canada-U.S. boundary to the northern limit of the area serviced by east coast ports and where marine drilling systems are used (Lancaster Sound at 75°N). The issue, in all studies is human safety, with property safety only to be considered to the extent it affects human safety.

The purpose of the study reported here is to describe and assess the means of communications in relation to eastern Canada offshore exploratory drilling and to provide practical possibilities for improving these means, if so required. The study requirements include provision for the following:

FIGURE 2. Royal Commission on the Ocean Ranger Marine Disaster - East Coast Offshore Study Area

i) To describe individual communications and total communications networks currently in use in the study area (internal communications systems of a drilling unit and external communications systems of each component of a "drilling system");

ii) To evaluate the suitability and adequacy of system described in (i);

iii) To identify and assess conditions resulting in the loss of communication between various components of a "drilling system" in the study area;

iv) To identify inherent redundancy within each communications link and network in terms of maintaining continuous communications between each component;

v) To identify communications systems under development and those currently in use in the drilling industry and other industries in other offshore areas; and,

vi) To identify the "most desirable" communications system (if current systems are found insufficient) for a "drilling system" off the Canadian east coast using combinations of individual systems currently in use or those under development.

1.3 Organization of Study

Background information for the study area, such as geographical and environmental aspects and the current level of drilling activity, is outlined in Section 2. This section also includes a summary of related information for some other offshore areas such as the Arctic and the North Sea. The offshore communications requirements and applicable regulations are discussed in Section 3. The communication systems currently operating in the study area are described in Section 4 while their assessment is undertaken in Section 5. Some of the

pertinent information for these systems was obtained through a questionnaire sent to Canadian Oil Companies and the Canadian Coast Guard. On the basis of these responses, typical systems are discussed. The applicability to the study area of systems operating in other offshore areas and those under development is explored in Section 6.

2.0 STUDY AREA

2.1 Geography and Environment

The area of concern extends some 3000 km from the United States border in the south, to Lancaster Sound at the entrance to the Northwest Passage. The climate varies from temperate to Arctic. The width of the continental shelf to the 200 m isobath varies from 200 km of Nova Scotia to 400 km southeast of Newfoundland. Further North off Labrador the shelf break generally occurs at 300 m and 150 km from the coast. East of Baffin Island, there is virtually no shelf and the sea-bed plunges to a depth of 1000 m within 50 km of the coast.

Exploration permits, reflecting the current knowledge of sedimentary basin structures on the east coast, have been awarded for parts of the Gulf of St. Lawrence, large parts of the Scotian Shelf (particularly near the Shelf break), the eastern and northern Grand Banks, northeast of Newfoundland and along the coast of Labrador (Figure 3). The only permit areas off Baffin Island are at the latitude of Davis Strait and at the entrance to Lancaster Sound. The relevant environmental parameters effecting communications for the five offshore sectors or regions of the study are summarized in Tables 1 to 4 (from Swail and Mortsch,1983).

Such environmental conditions or parameters as wind or waves, precipitation (rain, snow, thunderstorms), or the presence of sea ice may effect the quality of offshore communications and sometimes may even result in the break down of a communication link (see Sections 4 and 5). Electromagnetic waves are absorbed or attenuated by atmospheric water or moisture (precipitation - rain, snow, freezing rain, etc.), which results in the reduction of an effective communication range or distance. Similarly, the presence of significant ocean waves and, in particular, sea ice may reduce the usable range due to the attenuation of ground waves (radio waves,using the ground mode for propagation, i.e., propagating along the surface of the earth).

FIGURE 3. Oil and Gas Exploration Lease Areas

AREA	Mean Wind kt		Gale Wind (≥34kt)	Severe Storm Yearly Average (Sustained Winds kt)	Remarks
	Min.(Month)	Max.(Month)	%time (mth)/persistence in days		
Sable Scotian Gulf	11(July)	21(Jan)	10 (Jan)/ 2 - 3	Once (70)	Hurricanes - anytime from May to Nov. more likely between Aug. and Oct.
Gulf of St. Lawrence	12 (July)	21(Dec. to Feb.)	12(Dec. to / 2-3 Feb)	Once (70)	Hurricanes,occasional, but with reduced winds, local coastal effects important.
Grand Banks	11 (July)	21(Dec. to Jan)	12-13(Dec / several & Jan)	Once (75)	Hurricanes occasional
Labrador Sea	12-13 (June to April)	19(Nov. to Jan.)	11(Dec to /Several Feb.)	Once (65-75)	Mean winds for Eastern portion. 24kt from Nov. to Feb.
Davis Strait/ Baffin Bay	12/7-9 (June to Aug.)	19/16 (Dec. to Feb.)	6-8 (Dec. to Feb)-West Davis 3(Jan) -Baffin	Once (60/50)	Local coastal effects important.

Legend: ≥ (Greater than or equal to)
% (Percentage)
kt (knots)

TABLE 1: Extreme Wind Speed Summaries for East Coast Offshore Areas (Adapted from Swail and Mortsch,1983)

AREA	Highest Month % Heavy Rain *	Month Occur	Highest Month % Thunderstorms	Month Occur
Sable Scotian Shelf	3	May - Aug.	0.6	July
Gulf of St. Lawrence	3	Oct. - Nov.	1.0	July - Sept.
Northern Grand Banks	4	Sept.-Nov.	0.3	July
South Labrador Sea	3	May	0.2	July - Aug.
Davis Strait	1	July	0.1	Several

*Rainfall rate greater than 7.6mm/hour

TABLE 2: Frequency of Heavy Rain and Thunderstorms for East Coast Offshore Areas (from Swail and Mortsch,1983)

AREA	Maximum % Time Freezing Precipitation	Months (Occurrence)	Months with Freezing Precipitation
Sable Scotian Shelf	0.5	(Feb. - Mar.)	Jan. - April
Gulf of St. Lawrence	1.7	(March)	Nov. - May
Northern Grand Banks	0.4	(Jan.- April)	Dec. - April
South Labrador Sea	1.0	(February)	Nov. - May
Davis Strait	0.8	(October)	All

Legend: % (Percentage)

TABLE 3: Freezing Precipitation Summary for East Coast Offshore Areas (From Swail and Mortsch,1983)

AREA	Maximum % Ceiling (< 300 ft) or Visibility (< 0.6mi)	Month Occur	Month with > 10% Frequency of Ceiling (< 300 ft) or Visibility (< 0.6 mi)
Sable Scotian Shelf	36	July	All
Gulf of St. Lawrence	30	July,August	All except February
Northern Grand Banks	45	July	All
South Labrador Sea	21	June	All except April,September
Davis Strait	10	May	May

Legend: % (Percentage)
< (Less than)
> (Greater than)

TABLE 4: Flying Weather Statistics for East Coast Offshore Areas (from Swail and Mortsch, 1983)

A summary of extreme wind conditions for the study area as shown in Table 1 indicates only a slight difference among the five offshore regions or sectors of interest. The minimum and maximum mean monthly wind speeds appear to be about 7 to 10 kt and 21 kt (10.8 m/s), respectively, with gale force winds (greater than or equal to 34 kt) prevailing around 10 percent of the time during the extreme months. Severe storms (winds 65 to 75 kt) seem to average once a year in each of the five representative east coast areas with slightly different frequencies of thunder storms and heavy rain (Table 2). The probability of freezing precipitation (Table 3) tends to decrease with distance from land. Offshore, most freezing precipitation is associated with frontal activity and may last for a number of hours (3 to 24 hours) in an extreme month. In contrast, the combination of low cloud ceilings and low visibilities, which are of interest to aircraft operations appear to be very frequent (Table 4). Ceilings less than 300 ft or visibilities less than 0.5 mile (0.8 km) can seriously curtail aircraft operations and thus increase the importance of proper communications.

As noted earlier, in addition to atmospheric and oceanographic parameters, the presence of sea ice influences the effective range of offshore communications and communications quality. The advance of sea ice in the study area from September to March is depicted in Figure 4. The ice starts to retreat in April and by May the Gulf of St. Lawrence and the Northern Grand Banks are normally clear. The Labrador Coast normally clears of ice during June and July, while at the same time, open waters in northern Baffin Bay start to expand southward. Sea ice normally reaches its minimum extent by mid-September. The variations in the maximum annual extent of the ice cover indicates that while the Grand Banks is ice free during a normal winter, it can be totally ice covered during a severe ice year (Figure 5). Although ice has come close to Sable Island (within 40 km) on several occasions, the island remains outside the extreme limits of sea ice.

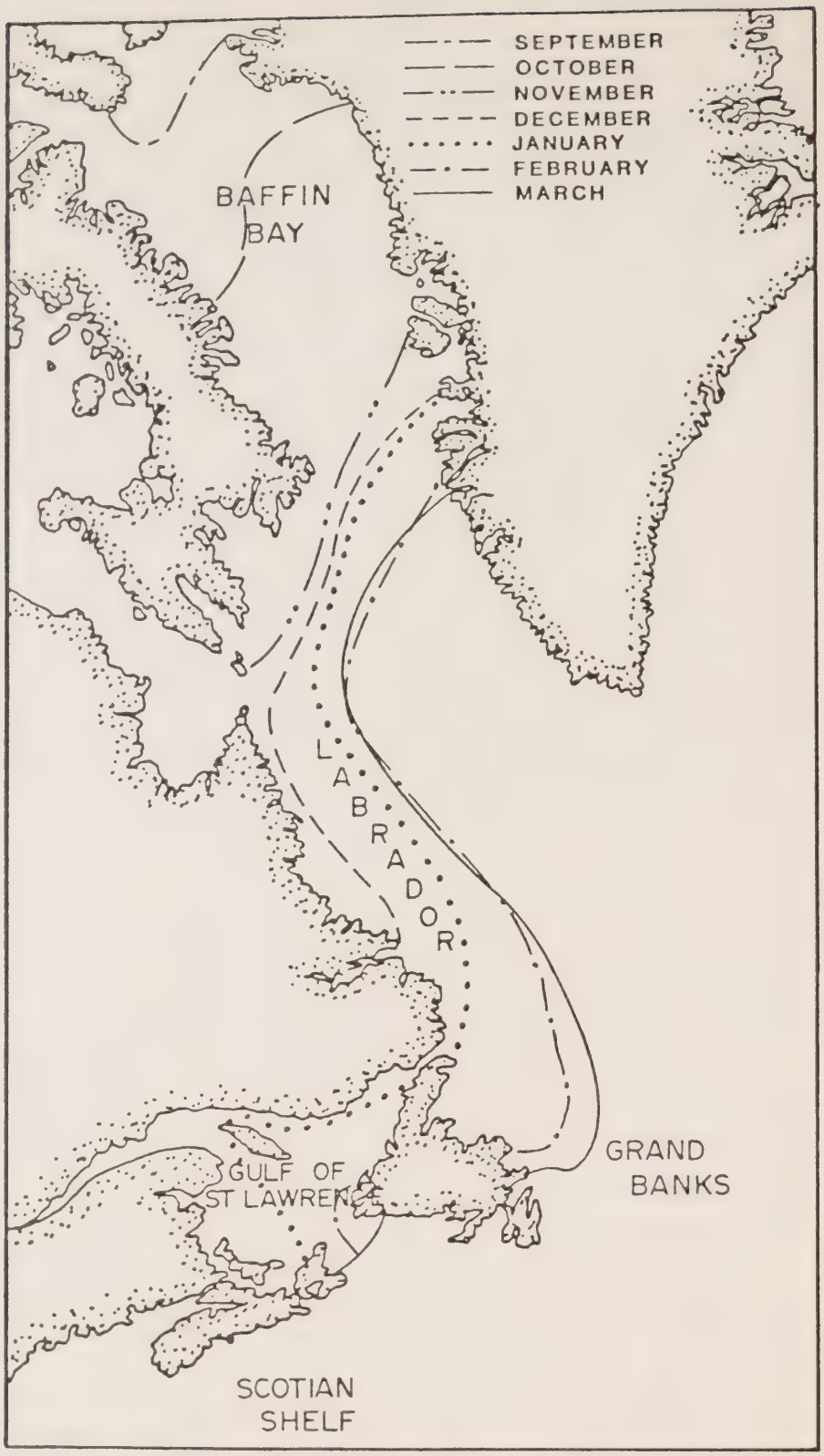


FIGURE 4. Advance of sea ice from September to March

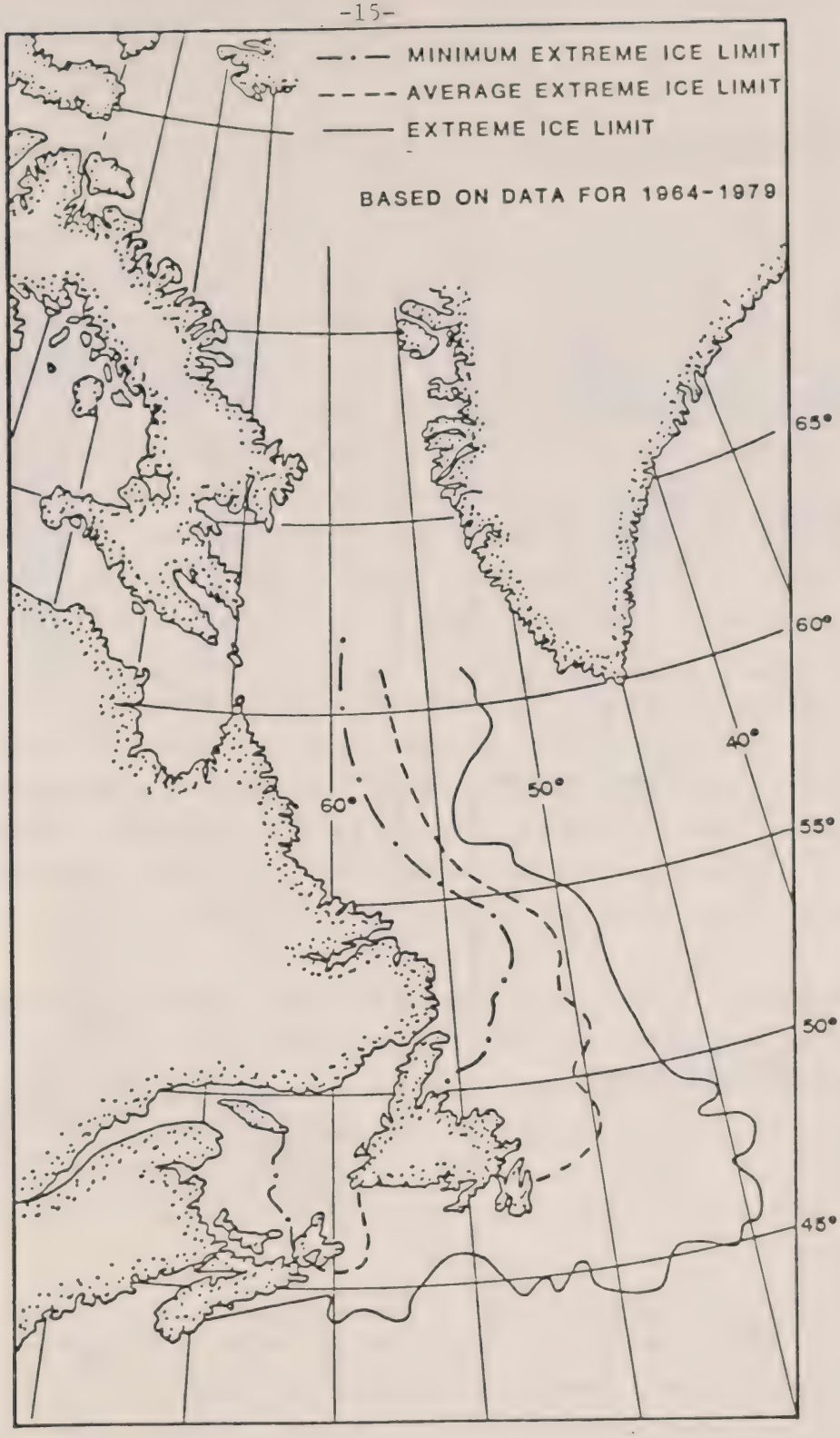


FIGURE 5. Extreme sea ice limits

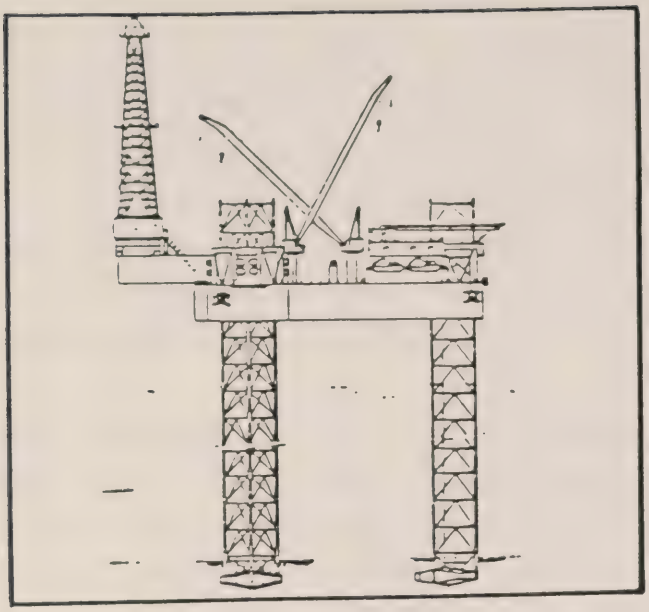
2.2 Exploration Activity

To date offshore drilling in the study area has been restricted to the open water conditions, and the type of rig employed (Figure 6) has been dictated by the water depth, wave conditions, and the need for mobility in the path of icebergs or pack ice. Year round drilling has only been possible off Nova Scotia and, with due attention to icebergs and occasional incursion of sea ice, on the Grand Banks. Jack-up systems have been used in the Gulf of St. Lawrence and in the shallow waters close to Sable Island off Nova Scotia. Elsewhere off Nova Scotia and on the Grand Banks off Newfoundland, anchored semi-submersibles have been used.

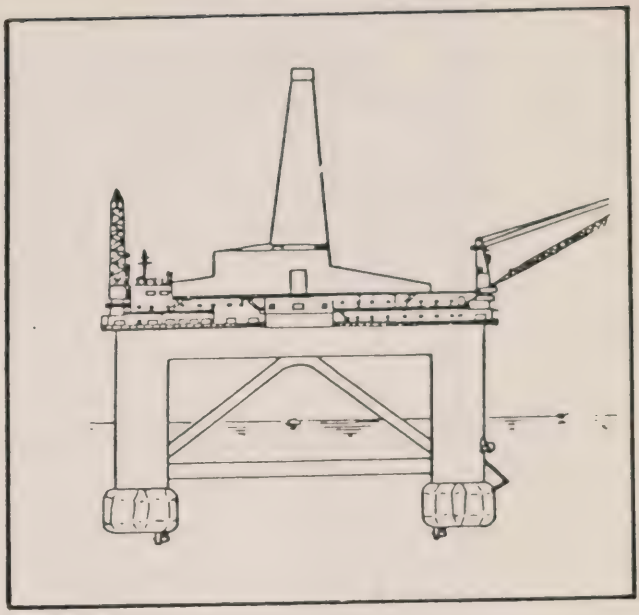
Off Labrador and in the Davis Strait, drilling has been restricted to the summer months. But dynamically positioned vessels, generally drill-ships, have been used to meet the need for mobility in the path of icebergs. Supply boats (Figure 6) are used on a frequent schedule between a drill unit and a shore base. At least one supply boat is required to stand by a drill unit at all times.

These drill units and vessels used offshore provide motion or orientation stability to varying degrees and offer different heights for mounting communication antennas. A comparison of expected motions (theoretical) that are likely to be encountered by fixed offshore structures is given in Table 5. The practical values may be significantly less and the heave component may be as much as 7m (OST,1981).

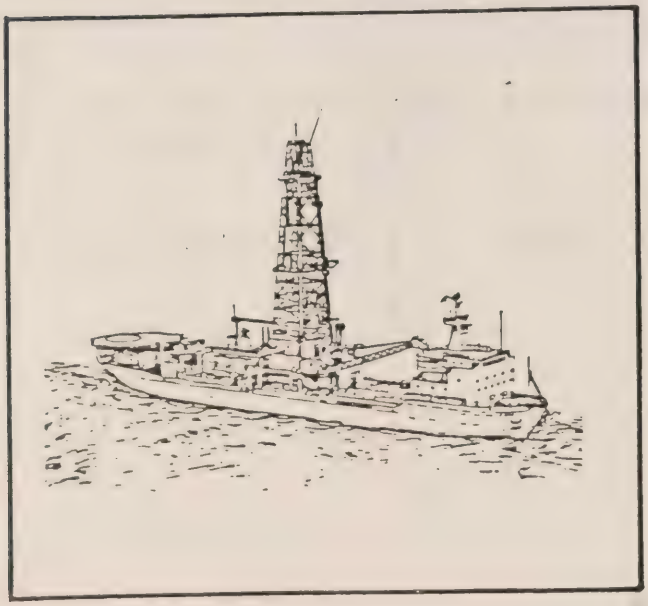
During 1983, seventeen drill units were operational in the study area. Among these, four drill ships operated on the Labrador Shelf; four jack-ups operated of Prince Edward Island, New Brunswick, and Nova Scotia; and nine semi-submersibles drilled off Nova Scotia and Newfoundland. A similar level of exploration activity is expected to continue during 1984 and 1985 in the study area.



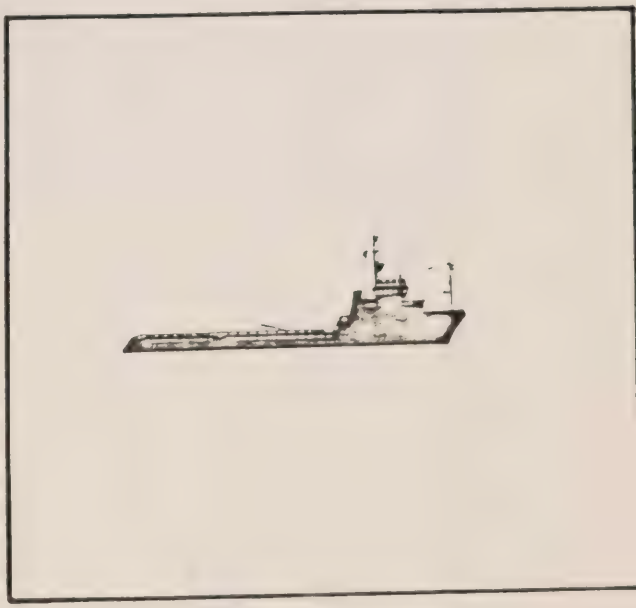
(a)



(b)



(c)



(d)

FIGURE 6. Typical drilling platforms and vessels in use off Eastern Canada. (a) Jack-up, (b) semi-submersible, (c) drillship, and (d) supply vessel.

Type	Max Roll (Degree)	Pitch (Degree)	Yaw (Degree)
Semisubmersibles (e.g. 3, 4, and 5 footings; Twin Hull)	10 - 15	10 - 14	1.5 - 3
Drillship	37	23	8
Tension Leg Platforms	0	0	6
Buoy	30	30	5

Table 5. Example of Expected Theoretical Motions (30m wave conditions assumed) For Non-fixed Offshore Structures (From OTS, 1981)

Table 6 provides the approximate distances involved in the current offshore exploration drilling from some typical shore stations. For these drilling operations, communications are primarily required up to distances of 1000 km from the base stations located in St. John's and Halifax, although the vast majority of operations are within 500 km of the base station. However, greater distances (1500 km and more) are involved for communications from St. John's and Halifax to activities off Labrador and further north.

Past exploration activity, as indicated by the lease acreage holdings, has shown that more than one operator (oil company or consortium) may be involved in drilling at two near-by locations (e.g. within 50 km) at one time. Also, two drill units may operate simultaneously at distances of just several kilometres apart.

2.3 Comparison With Other Exploration Areas

Among the other areas where exploration is currently taking place are the following:

- Western Arctic (e.g. Beaufort Sea)
- North Sea
- U.S. West Coast (e.g. off Alaska)
- Gulf of Mexico

As a way of illustrating the differences, Table 7 compares some relevant environmental statistics among the Grand Banks, North Sea, and Beaufort Sea regions. The month of February corresponds to the winter conditions and the month of July to the summer conditions.

As drilling in the Beaufort Sea until recently took place during the summer months, the July data only has been presented. In general, the Grand Banks environment appears to be the most severe. But in the Beaufort Sea, sea ice is present even during the summer months.

Area	Typical Shore Stations	Distance/Range (km)
Scotia Shelf	Primary - Halifax	200-500
	Secondary - Sable Island	0-500
Gulf of St. Lawrence	Saint John, New Brunswick	200-400
	Prince Edward Island	0-200
Grand Banks	St. John's, Newfoundland	300-500
	Halifax, Nova Scotia	1300-1500
Labrador Shelf	Hopedale, Labrador	100-500
	Halifax, Nova Scotia	1200-1600
	St. John's, Newfoundland	100-1500
Baffin Bay/ Davis Strait	St. John's, Newfoundland	
	Halifax, Nova Scotia	1500-3000

Table 6 : Approximate Distances Between Offshore Exploration Areas and Some Typical Shore Stations

Parameter	February		July		
	Grand Banks	North Sea	Grand Banks	North Sea	Beaufort Sea
% Frequency Gale Force Winds ($\geq$ 34 kt)	15	10	< 1	< 1	< 1
Air Temperature (^{o}C)	-1	5	11	13	4
% Frequency Fall Precipitation	33	24	10	15	16
% Frequency of Snow from all Precipitation	60	20	0	0	10
% Frequency of Visibility Less than 4 km	10	5	50	10	25
% Waves Greater Than or Equal to 3.5m	30	25	< 5	< 5	0

Table 7 Comparisons of Environmental Statistics for Grand Banks, North Sea, and Beaufort Sea (from Meserve, 1974; USDI, 1977; NORDCO, 1984)

The main difference between the study area and the Western Canadian Arctic is that most, if not all, of the exploration taking place in the far north at present is in close proximity to land masses (within 100km), whereas generally larger distances (approximately 500 km or less) are involved in the study area. The offshore distances of concern in the North Sea (100 to 400 km) are comparable to those in the study area. However, at present there are two basic differences between operations in the North Sea and the study area. These are as follows:

i) exploration and production activities in the North Sea are occuring within the immediate vicinity of each other; and,

ii) the density of offshore activity in the North Sea at least in the southern sector is such that line-of-sight direct communications between units (drill or production) is possible.

In addition, North Sea systems operate in relatively shallow water and do not have to contend with ice, allowing the use of fixed platforms.

In comparison with exploration platforms, the production platforms require more of a permanent communication link. The production platforms may be fixed or non-fixed, but in either case, are designed on a "fixed for life" or site-specific concept. Due to their fixed nature and long term use, costly and integrated communication facilities or installations are cost effective on the production systems.

The exploration activities off the American west coast and in the Gulf of Mexico are also being undertaken near the shore (within 100km). Up to four hundred jack-up rigs are operating in the Gulf of Mexico, indicating the significant density of offshore activity. Approximately half of these rigs are involved in a production phase.

3.0 COMMUNICATIONS NEEDS AND REGULATIONS

3.1 Study Area Needs

As noted earlier, the basic need during offshore exploration is the capability for communications between;

i) drilling unit and shore base,
ii) drilling unit and support vessel(s),
iii) drilling unit and helicopter,
iv) shore base and support vessels, and
v) shore base and helicopter.

Each of the above needed communications links, except possibly for (i), involves a variable distance or range. The distance between the drilling unit and the shore base remains fixed for a long period of time (up to several months) coinciding with the exploration activity taking place at one location. However, at certain times a drill unit may have to move from its drilling location to avoid an approaching sea ice pack or iceberg.

These communications links may require provision for the following services;

i) transmission/reception of voice-telephone throughout most of the day,
ii) transmission/reception of printed page (text or drawing) - telecopier or facsimile for several hours per day,
iii) transmission/reception of text (alphanumeric characters) - teletype or telex for few hours per day, and
iv) transmission/reception of data (e.g., air and sea temperatures).

A drilling unit, being the main or central component of a "Drilling System", requires regular and possible lengthy contact with its controlling office (i.e., shore base). Due to the critical and costly nature of oil/gas drilling, immediacy of access to the base

is essential. Also, due to the sensitive nature of the drilling information or results, high confidentiality in communications circuits or links is usually required. Practically all the services listed above are needed on a drilling unit to allow communications with a shore base.

Voice is the primary mode of communications between a drill unit and a shore base as well as between other components. Facsimile and teletype are needed to transmit written information such as the daily drilling and progress reports to a shore station. Thus, there is a requirement for quality long distance telephone and fascimile communications. A reliability greater than 95 percent has been stated to be adequate in meeting communications needs of an oil company (Petrie and Campbell, 1974). However, a need for reliability of as much as 99.8% has been quoted for the North Sea operations (Hill, 1980). The data transmission need is obviously dependent on the operations and procedures of each company.

A drilling unit also needs to maintain voice communications with support vessels and transport helicopters. Voice communications capability is also needed between a shore base and support vessels and helicopters. It is a usual practice for a helicopter to maintain a twice weekly schedule, while support or supply vessels may also follow some schedule (e.g., a 2 day cycle), between a drill unit and a base.

In addition to meeting the business needs as well as the social needs of their staff, offshore drill units and support vessels must be capable of communicating emergency or distress signals. These and other requirements follow from the Canadian and international regulations.

3.2 Study Area Regulations

The relevent regulations (Figure 7) are basically concerned with the assignment of electromagnetic frequencies, the type of installation (equipment) required and associated issues. The frequency

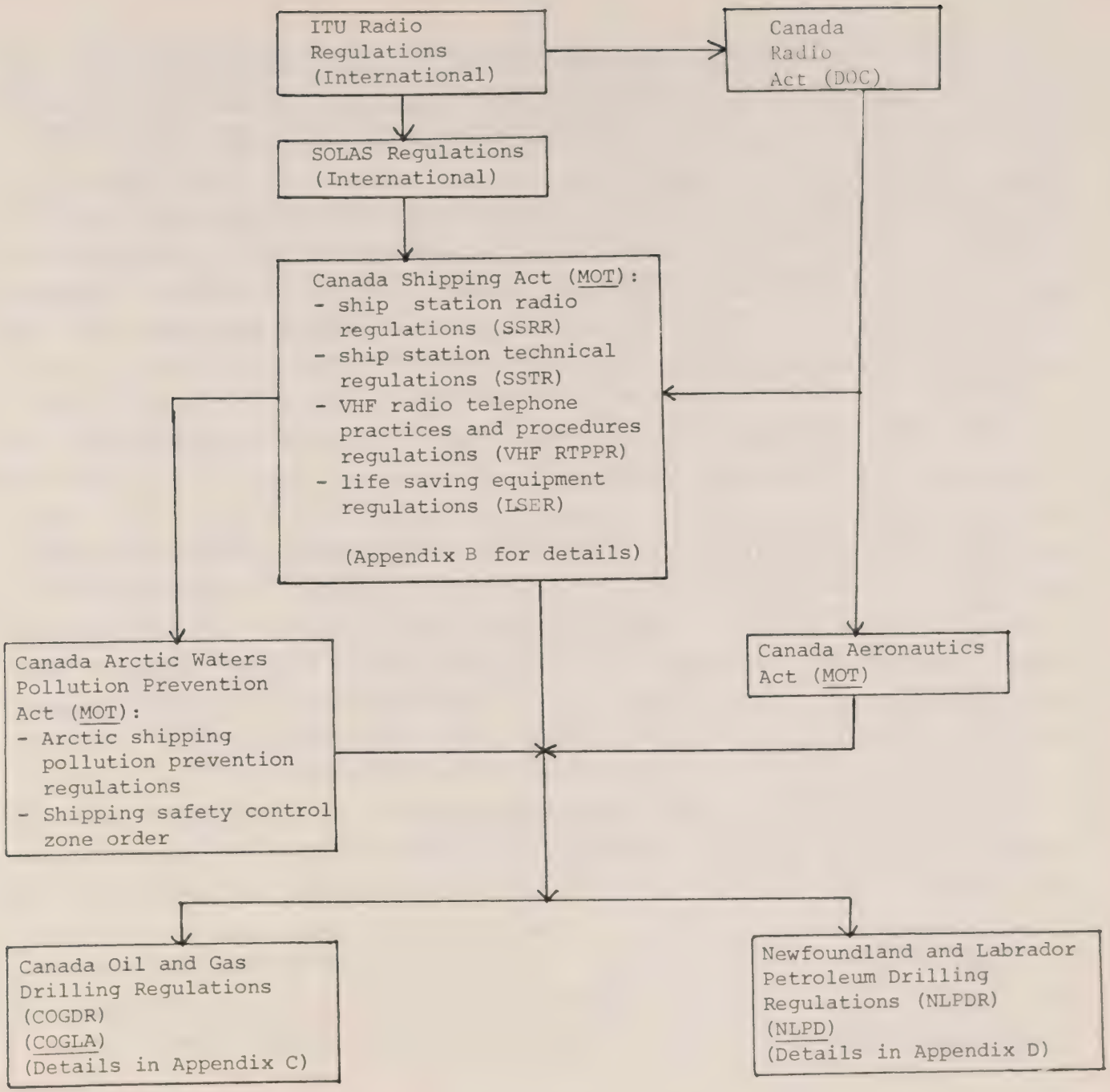


Figure 7: Relevant Regulations for the Study Area (Canadian and Provincial Departments or Ministries Administering Regulations are Underlined)

allocations and related aspects (e.g., technical standards) for various communications and other radio services on a world-wide basis are controlled by the International Telecommunications Union (ITU) under an international treaty (ITU, 1959). Similarly, ships registered in countries which are party to the International Convention for the Safety of Life at Sea (SOLAS), must comply with a set of regulations governing radio installations and communications procedures (SOLAS, 1974). To date more than seventy countries are signatories to the SOLAS convention including Canada.

The ITU frequency allocations are further sub-divided by regulations of individual countries for use among particular types of services within the national boundaries. Canada has these (e.g. Radio Act) and other regulations including those governing installations and procedures pertaining to maritime mobile communications (communications between a coast station and a ship or between ships). These regulations (Appendix B, C, and D) are fairly detailed and comprehensive but there appears to be some minor conflict among certain regulations and some aspects need clarification.

It is unclear as to what classification a drilling platform comes under in current national and international maritime regulations now in effect. These regulations are basically defined in terms of ship type (cargo, passenger, etc.). It has been a common practice to date to treat a drilling platform as a cargo ship. But in order to clarify the situation the Canadian Coast Guard (CCG) is in the process of preparing standards for Mobile Offshore Drilling Units (MODU's).

More importantly, there is some question regarding the applicability of Canadian regulations to offshore drilling platforms (especially semi-submersibles, jack-ups, and artificial islands) which are not registered in Canada and operate outside of 12 mile coastal limit (territorial waters) even though within the 200 mile economic zone (EPOA/APOA, 1983 and RCORMD Hearings, Wilcox, 1982). The legal or jurisdictional aspects of relevant regulations are beyond the scope of this report. A description of these regulations is provided below without regard to their strict legal applicability to offshore

operations in the study area. In any event, the communications needs ofthe offshore operators (oil companies) seem to generally outweigh the requirements set forth in these regulations.

The general relationship among the relevant regulations is shown in Figure 7. The key regulations are SOLAS and those under the Canada Shipping Act. The Canada Shipping Act regulations include those of SOLAS. The remaining Canadian regulations (including provincial, such as those of the Government of Newfoundland and Labrador - NLPDR, which is administered by the Newfoundland and Labrador Petroleum Directorate (NLPD)) basically add on to these regulations or make them more specific.

The basic SOLAS regulations (applicable to signatory countries) are summarized in Table 8. Normally in order to inspect a foreign SOLAS convention ship, a request must first be received from the country of registry. This was the procedure followed for the "Ocean Ranger". Under special circumstances ships can be exempted from these regulations as was done with the "Ocean Ranger" (RCORMD Hearings, Wilcox, 1982). Ships registered in countries, which are not parties to SOLAS when inspected are not issued safety Radio Certificates as per normal practice but are inspected to the Canada Shipping Act (CSA) and SOLAS regulations for customs clearance purposes only.

The Canadian Shipping Act (CSA) applies to all ships operating in the Canadian waters while the Arctic Water Pollution Prevention Act Regulations additionally apply to Northern waters. These regulations are much more stringent than those provided under the SOLAS convention. The Ship Station Radio Regulations (SSRR) set further communication equipment requirements for ships. They require that the installation and equipment meet at least the standards set forth in the Ship Station Technical Regulations (SSTR) and the standards for Radio Installations and Related Equipment (CCG, 1982). Anyone wishing to operate a land radio station in Canada must apply for and acquire a valid license (Dept. of Communications, RSP 101, 1972). Both coast and ship station transmitters and receivers must meet strict Canadian standards (Dept. of Communications, RSS 181, 1970).

INSTALLATION	RANGE (NMI)	FREQUENCY	RECEIVER SENSITIVITY (MICROVOLTS)	ANTENNA	EMERGENCY EQUIPMENT
Radio-Telegraphy (reserve system required)	150 (>1600 tons) 100 (<1600 tons)	TX 500 KHZ - 2 working frequencies between 405 and 535 KHZ emissions determined by ITC-RR* RX 500 KHZ - frequencies used for time signals, meteorological information other frequencies related to safety of navigation - emissions determined by ITC-RR	50	Main antenna plus spare	- Radio Telegraph Auto Alarm (unless 24 hour watch maintained) - Radio Telephone Distress Watch Receiver
Radiotelephone Installation (For cargo vessels < 1600 tons) and not fitted with radio-telegraphy equipment	150 (≥ 500 tons) 75 (≥ 300 tons, for new installations 15 watts required, no range given)	TX - 2182 KHZ - at least 1 other frequency between 1605 and 2850 KHZ - emission designated by ITC-RR RX - 2182 KHZ - 1 other frequency between 1605 and 2182 KHZ - meteorological information - any other related to safety of navigation - using emissions designated by ITC-RR	50	"	- Automatic Radiotelephone Alarm Signal - Radio Telephone Distress Watch Receiver

TABLE 8

A SUMMARY OF MAIN COMMUNICATIONS EQUIPMENT REQUIREMENTS NECESSARY UNDER SOLAS FOR RADIO INSTALLATIONS ON CARGO VESSELS

*ITC-RR - International Telecommunications Convention Radio Regulations

NOTES:

1) These regulations apply to cargo vessels over 300 tons gross tonnage.

2) All installations require sufficient reserve power to operate normally for six hours.

3) One portable lifeboat radio apparatus is required on each vessel.

4) The equipment standards are governed by the most recent International Telecommunication Convention (ITC), which also provides the Radio Regulations (RR).

5) Canada has utilized the equivalency clause of the SOLAS convention to allow under certain conditions the fitting of a SATCOM installation in lieu of a radiotelegraph installation when making international voyages.

The specific equipment requirement based on the CSA are, in part, determined by which of the three frequency zones (Figure 8) the ship is operating in: VHF, MF, HF, or International (outside HF coverage). The basic radio equipment requirements for a ship in each of the areas is summarized below (CCG, NR, 1981, also see Appendix C for details):

VHF	MF	HF	International
2-VHF radio-telephones or 1-VHF and 1-MF radio-telephone	1-VHF and 1-MF radio-telephone	1-VHF and 1-MF radiotelephone & either 1-MF/HF radiotelephone or 1-MF radiotelegraph	1-VHF and 1-MF radiotelephone & 1-MF radio-telegraph

Under the SOLAS convention in any of these areas the drilling rig would only be required to have a MF radiotelegraph system (which, incidentally transmits and receives Morse code only). For supply vessels which are usually less than 1600 gross tons the only difference in the Canadian equipment requirements regulations from the preceding is that in ocean areas beyond HF areas they must carry 1 VHF and 1 MF radiotelephone, and 1 MF/HF Radiotelephone or 1 MF radiotelegraph. Under the SOLAS convention these ships would only require 1 HF radiotelephone or 1 MF radiotelegraph.

Some details of the equipment requirement per the SSTR are provided in Table 9. These include the emission type and levels. To improve the efficiency of maritime commincations, only single sideband emissions made in MF and HF bands is permissible (Dept. of Communications, TRC-11, 1977; TRC-14, RSS 181). Under the SSTR, radio watches must be maintained on a continuous basis. Also under the SSTR each MF radiotelegraph installation must be operated by an operator holding at least a Second Class Radiotelegraph Operator's Certificate, and MF, MF/HF and VHF radiotelephone installations must be operated by a person holding the same or at least a Restricted Radiotelephone Operator's Certificate. These certificates, of course, are those issued by the Canadian Government under the Radio Act.

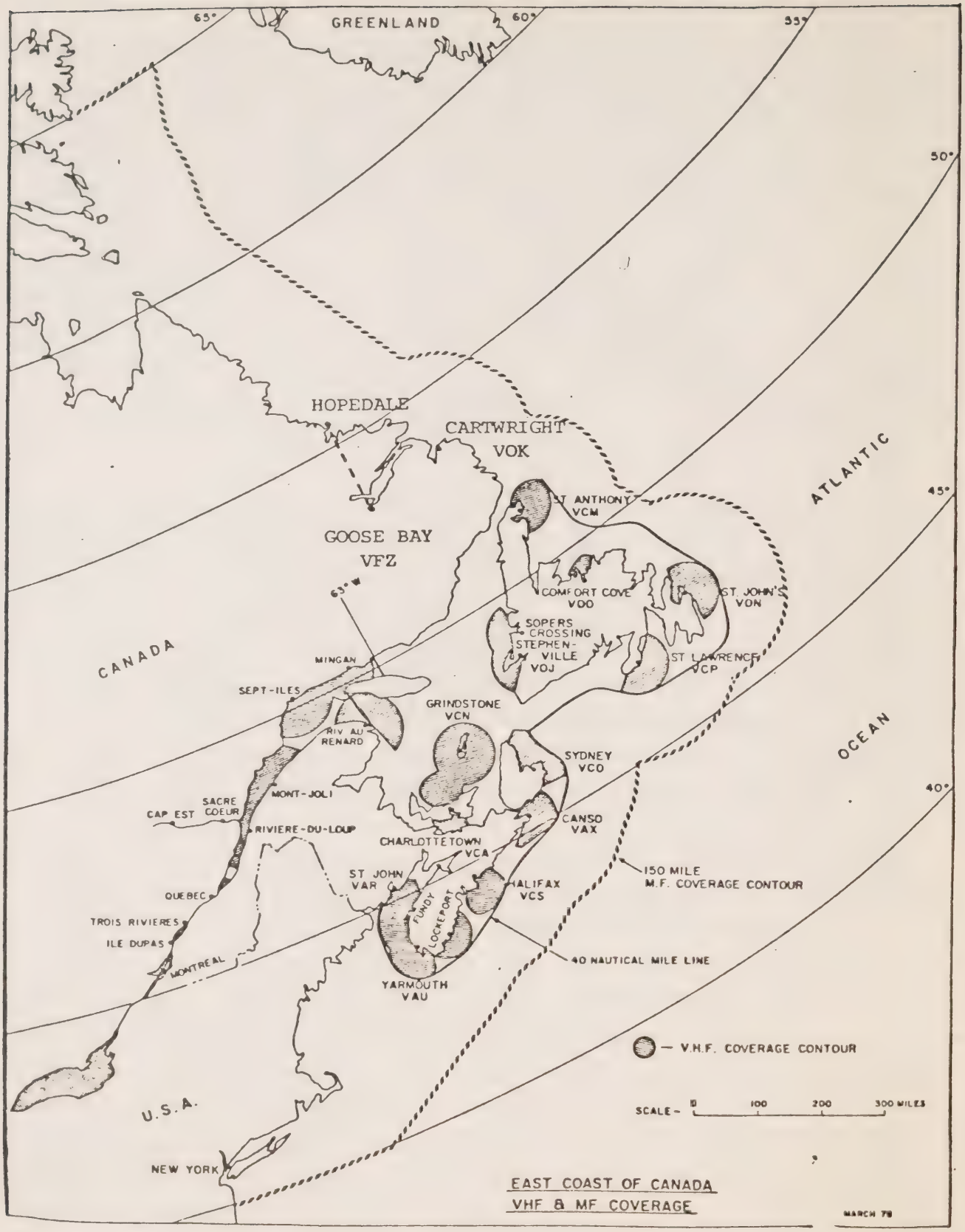


FIGURE 8 Coast Guard Radio Station Coverage Zones for East Coast of Canada (From CCG, NR; 1981)

INSTALLATION	RANGE (NMI)	FREQUENCY AND EMISSION TYPE	TRANSMITTER POWER (WATTS)	RECEIVER SENSITIVITY (MICROVOLTS)	ANTENNA	ALARMS
MF Telegraphy (reserve system required)	150 (>1600 tons) 100 (<1600 tons)	TX -410 KHZ-A1,A2 or A2H -500 KHZ-A2 and A2H -any two of 425 KHZ-A1,and A2 or A2H 454 KHZ- " 468 KHZ- " 480 KHZ " 512 KHZ " RX -405 to 535 KHZ- A1 and A2 or A2H	NP*	25	-designed and installed to provide maximum practical efficiency	- Alarm signal keying device -receive auto alarm
MF Radiotelephone	150	TX -2182 KHZ -one inter-ship, channel appropriate to area -one ship-to-shore public correspondence channel appropriate to area of operation -A3H and A3A or A3J RX A3, A3H and A3A or A3J -frequencies as above and for meteorological and safety of navigation data	25	1.5 (A3 or A3J 3 (A3 and A3H)	" -as high as practically possible -ships ≥ 20 metres require one spare for 2182 KHZ	-Alarm signal devise -Radio-telephone distress frequency watch receiver

*NP - Not Provided

TABLE 9

A SUMMARY OF THE MAIN EQUIPMENT REQUIREMENTS NECESSARY UNDER CSA SSTR RADIO INSTALLATIONS ON CARGO SHIPS

Explanation of Emission Codes

Telegraphy	A1	Telegraphy without the use of modulating audio frequency.
	A2	Telegraphy using amplitude modulation of an audio frequency.
	A2H	Modulated tone using a full carrier (used for emergency beacon)
Telephony	A3	Double sideband, full carrier.
	A3A	Single sideband reduced carrier.
	A3H	Single sideband full carrier.
	A3J	Single sideband suppressed carrier.
	F3	Frequency modulation.

TABLE 9 (Cont'd)

INSTALLATION	RANGE (NMI)	FREQUENCY AND EMISSION TYPE	TRANSMITTER POWER (WATTS)	RECEIVER SENSITIVITY (MICROVOLTS)	ANTENNA	ALARMS
MF/HF Radiotelephone	150	Same as MF telegraphy installation plus -A3A or A3J on at least one two frequency duplex ship-to-shore channel in each of the 4,6 and 8 MHZ Maritime Mobile Bands as appropriate to the area -A3H at 2182 KHZ	- 35 - 25 if system installed before Jan. 1/80	NP	NP	"
VHF Radiotelephone	NP	F3 -156.8 MHZ -156.3 MHZ -one public correspondence frequency appropriate to area -such other VHF channel as required for safety purposes and appropriate to area -frequencies which provide navigation warnings	- 15 to 25 (must be reducible to one watt) -10 on installations before Jan. 1/80	2	vertically polarized as high as possible	NP

NOTES:

1) These regulations only apply to Canadian Registered Cargo Vessels or Foreign Registered Cargo Vessels licensed to routinely operate in Canadian territorial waters. Also current practice is to class offshore drilling platforms as cargo vessels.

2) All installations require sufficient reserve power to operate normally for six hours.

3) Above 65°N all ships must carry a spare antenna completely assembled and capable of quickly replacing its main antenna.

4) Type A or Arctic Class Ships north of 65°N latitude and in a shipping safety control zone must have equipment capable of receiving fixed images transmitted from a Canadian radio station and an ice reconnaissance aircraft.

5) One portable lifeboat radio apparatus is required on each vessel.

6) The Canadian Government under the equivalency clause of the CSA will allow certain cargo vessels to be fitted with a SATCOM installation in lieu of a radiotelegraph installation.

Two types of operator's certificates, general and restricted, are usually issued by the Canadian Department of Communications (DOC) for each of the three classes of radiotelephone or radiocommunications (radiotelephone or radiotelegraph) services, i.e., maritime, aeronautical, and land. The holder of a Radiotelephone Operator's General (ROG) certificate (Maritime) may act as a radiotelephone operator on ship or coast stations fitted only with radiotelephone equipment where the power in the antenna of the unmodulated carrier wave does not exceed 100 watts maximum or 500 watts maximum (provided the operation of the transmitter requires only the use of simple external switching devices excluding all manual adjustment of frequency determining elements). The holder of a corresponding restricted (ROR) certificate may act as a radiotelephone operator only on ship or coast stations not open to public correspondence and the power does not exceed 250 watts and the transmitter operation requires simple external switching devices excluding all manual adjustment of frequency determining elements. The examinations for the ROG maritime certificate basically consists of three written sections (equipment fundamentals; operating procedure radio regulations and safety of life operating procedures) and one oral section (operation, adjustment and simple maintenance of pertinent equipment). The examination for the ROR maritime certificate is usually only oral but may cover all the above areas. All the radio station certificate requirements are being reviewed by a task force set up by DOC.

Under the Aeronautics Act, a helicopter (a prime mode of transport between offshore platforms and shorebases) must be able to maintain two way communications (voice) with a control centre througout its flight. The type of equipment is not specified. The helicopter is also required to carry an emergency locator transmitter and, under instrument flying rules, radio direction finding equipment. Under the LSER a portable radio apparatus (radiotelephone) is to be carried on a ship for use in a lifeboat (but not necessarily stowed in a life boat). The SSTR states that this is to be a MF/HF radiotelephone or an MF radiotelephone (to operate at 2182 KHz).

The Arctic Waters Pollution Prevention Act requires under the SSRR that a Type A or Arctic Class Ship (as per the ASPPR) which is north of 65 parallel of North Latitude and in a shipping safety control zone (see Figure 9) must be equipped to receive fixed images transmitted from a Canadian radio station and an ice reconnaissance aircraft.

Foreign ships are only required to comply with Canadian regulations if they routinely operate in Canadian waters (for which they require a special license). Those which only enter Canadian waters very rarely are only inspected for compliance with SOLAS convention regulations and only then when Canada is requested to do so by the country of registry or before it departs a Canadian port. The DOC carries out all inspections on behalf of Ministry of Transport (via the CCG). Canadian registered ships must comply with the regulations in national and international waters. (Transport Canada, TP-1896, 1981).

Canada has applied the equivalency clause in the SOLAS convention to allow certain Canadian cargo ships to use satellite communications (SATCOM) installation in place of the radiotelegraph installations normally required by SOLAS (CCG, 1982). This applies to cargo ships normally engaged in coastal voyages but making occassional international voyages. These ships would not require radio officers but must have two deck officers who have been instructed in the proper use of the SATCOM installations.

The COGDR (Canada Oil and Gas Drilling Regulations administered by COGLA) and NLPDR (Newfoundland and Labrador Petroleum Drilling Regulations administered by NLPD) requirements for communication equipment on drilling units, in all important aspects, are identical. Both require compliance with the CSA and AWPPA regulations and also require the following:

i) a marine radio telephone (must be VHF according to COGLA),
ii) a single side band radio,
iii) a VHF aviation radio,
iv) a low frequency radio homing beacon,

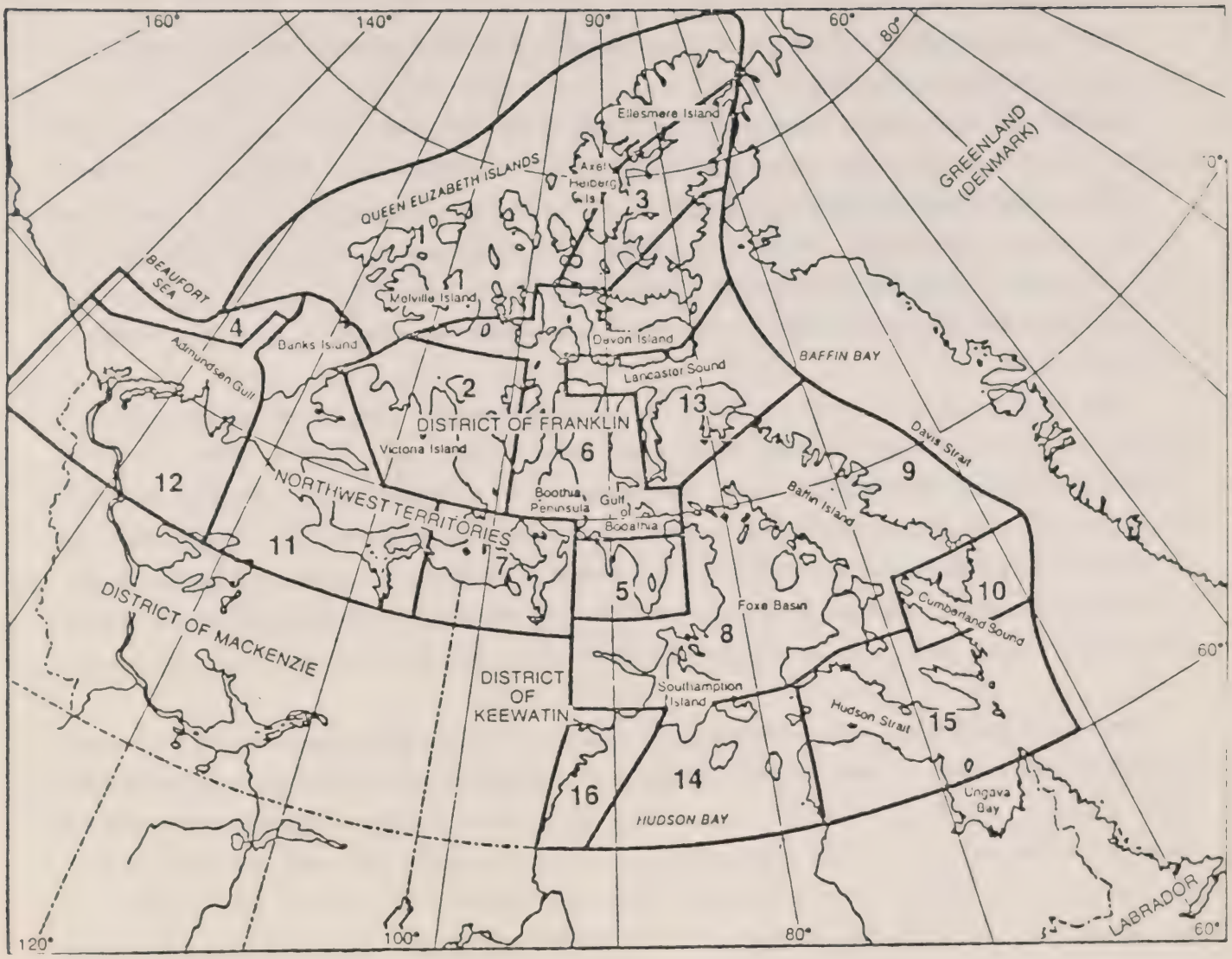


FIGURE 9. - Arctic Waters Pollution Prevention Act Shipping Safety Control Zones

v) a radio capable communicating with any support craft used in connection with the drilling operation, and,

vi) a facility for transmitting written data to and from the shore base,

vii) maintenance of radio logs (NLPD specific while COGLA general through the CSA),

viii) provision of emergency electric power (storage batteries) for at least twenty-four (24) continuous hours of radio operation (COGLA is specific in that the marine radio must be that required under the SSRR for transmitting or receiving on the distress frequency, while NLPD is general)

ix) internal communications (See Appendices C and D for Details).

The Newfoundland regulations do not specify that conversations be taped in diving operations whereas the COGDR do. Under the revised winter drilling guidelines the Newfoundland regulations specify that a standby vessel must maintain regular communication with the drilling unit and during storm conditions communications must be established, at least hourly, with status reports given and logged during each communication. This is not specified in the COGDR.

With regard to lifesaving equipment, the COGDR necessitated the addition of a water resistant emergency radio capable of communicating with rescue vessels, helicopters and drilling units, and an emergency locater transmitter. The Newfoundland regulations do not specify that the radio (in this case called a marine radio) be water resistant or to whom it should be capable of communicating. Also they do not require the use of an emergency locator transmitter. Additional Newfoundland regulations require that communication systems for real time weather and sea state information and data transfer be established among drilling units, and that all HF communications between drilling units and support craft and the operator's shore base be recorded on suitable recording equipment.

3.3 Regulations In Other Offshore Areas

The communications needs for other offshore areas are basically the same as those for the study area stated in Section 3.1 (Hyatt 1980; Hill, 1980; OST, 1981). Some of the applicable national regulations in other exploration areas such as the North Sea (e.g. Danish, British, and Norwegian regulations given in Appendix E, F, and G) are more general in terms of exact equipment requirements, but do concentrate on procedures. For example two requirements specifically stated in these regulations are the capability for a drilling platform to maintain communications with a shore station and the need for shutting down communications systems that may pose a hazard in certain operations. The Norwegian Regulations give the most detailed requirements for internal communications.

The Norwegian rigs also are separately classed as Mobile Drilling Platforms and are issued safety Radio installation certificates in accordance to that class. Examination of this certification does not suggest, however, that these regulations are any more stringent than those of the SOLAS convention.

The United States have no specific communications regulations for drilling rigs. The only requirement is that they comply with the SOLAS convention as cargo ships.

4.0 CURRENT COMMUNICATIONS SYSTEMS IN STUDY AREA

4.1 Means of Communications

Radio waves are used for communicating between two points. These waves may be propagated from the transmitting antenna to the receiving antenna through or along the surface of the earth, through the atmosphere, or by reflection or scattering from natural or artificial reflectors. Their propagation characteristics are dependent on frequency. Under the Radio Regulations of the International Telecommunications Union (ITU), the electromagnetic or radio spectrum has been divided into frequency bands; the relevant bands are given below:

Very Low Frequency (VLF) 3-30 Kilohertz (KHz)
Low Frequency (LF) 30-300 KHz
Medium Frequency (MF) 300 KHz - 3 Megahertz (MHz)
High Frequency (HF) 3 MHz - 30 MHz
Very High Frequency (VHF) 30-300 MHz
Ultra High Frequency (UHF) 300 MHz-3 Gigahertz (GHz)
Super High Frequency (SHF) 3 GHz-30 GHz.

Frequencies in the range of 300 MHz to 300 GHz are sometimes referred to being in the microwave band. Also, it is a common practice to include the 2 to 3 MHz frequency range within the HF band. Each of the listed bands are used on a shared basis by various radio services. Certain portions of each band, by ITU convention, are reserved for exclusive use by designated services (e.g. Land, Marine, and Aeronautical Communications-Fixed or Mobile; Navigation; and Location). Similarly, specific frequencies are designated for specific applications under ITU and Canadian conventions. A relevant example is provided in Table 10 which lists Canadian Maritime Mobile safety and Communications frequencies.

The frequencies listed in Table 10 are those in general use by ships in Canadian waters for intership communications and for ship/shore communications with radio stations operated by the Canadian

Frequencies		Channel Numbers	Purpose and Remarks
Ship KHz	Coast KHz		
425 454 468 480 512	Normally one frequency between 415 and 490 as assigned		Public Correspondence
500	500		International distress and calling
2118	2514		Public Correspondence
2134			Intership (fishing vessels only)
2142	2538		Public Correspondence (S and NE Coast Nfld., Labrador & Atlantic Coast)
2182	2182		International distress and calling
2206	2582		Public Correspondence
2237			Intership (other than fishing vessels)
	2598		Weather & dangers to navigation broadcasts
2738			Intership (shared with US vessels)
4081.6	4376.0	407	Public Correspondence
4084.7	4379.1	408	Public Correspondence
156.3 MHZ		6	Intership Safety
156.4 MHZ		8	Intership Safety
156.80MHZ	156.80 MHZ	16	International distress, safety and calling
	161.65 MHZ	21B	Weather and dangers to navigation broadcasts
157.300 MHZ	161.900MHZ	26	Public Correspondence

TABLE 10. Canadian Maritime Mobile Safety and Communication Frequencies (From CCG, NR, 1981) (This table is for the Newfoundland region. Halifax CG Radio is the only east coast radio station which provides public correspondence ship to shore radioteletype service).

Coast Guard, Newfoundland Region (CCG, NR, 1981). The channel numbers, shown against frequencies in the 2 MHz band, have no international status, while those in the bands above 4 MHz, including the Maritime Mobile VHF band, are recognized internationally. The Canadian Coast Guard has a network of 52 radio stations in Canada (the east coast locations are shown in Figure 8) with the chief function of providing a comprehensive safety communications service to ships on MF, HF, and VHF bands in accordance with SOLAS. Thus, internationally designated distress and calling frequencies are monitored continuously at these stations, which also provide a public correspondence radio telephone and radio telegraph service to shipping by interfacing the radio signals from a ship to various destinations in Canada and in other countries through switched networks of land lines, under sea cables and satellite circuits.

Thus, each of the frequency bands from VLF to SHF is usable, depending on a particular application. The parameters which influence choice of a frequency or band are the communication path length and the electrical properties of the medium along the path. The electrical properties of the ground (land and water), such as the conductivity and dielectric constant, vary considerably from those of the atmosphere. At very low frequencies, ground waves (waves through or along the surface of the earth, also called surface waves) may be satisfactorily propagate for distances of several thousand kilometers. At high frequencies, losses are so great that signals can be propagated for only a few hundred kilometers by ground waves.

Propagation in the MF and HF bands is chiefly by ground wave and reflection from the ionosphere, and severe fading (loss of signal) is caused in these frequency bands by the interference between gound and ionospheric waves at certain distances. At these and higher frequencies the ray path bending properties of the atmosphere (due to a change in the atmospheric refractive index with height) are used to provide satisfactory direct communications up to several times the line-of-sight distance. Thus, the MF and HF bands are being utilized for long range communications beyond the horizon while the VHF and higher frequencies are employed for short distances such as over the

line-of-sight distance. The UHF and EHF bands are being used for satellite communications as outlined in following section.

Radio frequency is the most important parameter effecting communications, as other parameters, which effect the quality and quantity of communications, are also dependent on it. For example, the electrical properties (conductive and dielectric) of the earth and atmosphere are frequency dependent and the intensity of man made and other noise against which communication signals must compete is also a function of frequency. The size and effectiveness (gain or efficiency) of antennas (e.g. parabolic dishes, horizontal wires, and vertical whips) which are used for radiating radio waves into space and subsequently capturing (receiving) these waves from space are very much dependent on frequency. It is a common practice to define or specify an antenna size on the scale of the wavelength (wavelength, = speed of light (3×10^8 m/s) / frequency). Thus, higher frequencies mean shorter wavelengths which for a given antenna size mean larger antenna gains. Or in general, bigger antennas mean larger gains for a given frequency or wavelength. High frequencies or short wavelengths are desirable because they employ antennas of reasonable size. For example, a half-wave length antenna at 3 MHz (= 100 m) is 50 m long while the corresponding antenna length at 500 KHz (= 600 m) is 300 m.

It is a common practice to define the utility or effectiveness of a particular communication link in terms of its reliability. Reliability is defined as the percentage of time the signal-to-noise ratio at the receiving end will exceed a specific value. The signal (desired information) to noise (undesired interference) ratio (usually defined in decibels (db)) provides a quantitative measure for the quality of received message. For broadcast quality receptions 38 db signal to noise is needed whereas for telegraphy (75 bits per second transfer rate) 2 db signal to noise ratio is adequate. For 90 percent intelligibility of speech, a signal to noise ratio of at least 14 db is required.

The noise level affecting the communication quality is dependent on the bandwidth of the signal or information being communicated. An increase in the signal bandwidth generally means an increase in the interfering noise. The bandwidth is a measure of the rate of transfer of signal, data, or information. For example, the continuous wave morse code telegraphy (A 2 emission of Table 9) which transfers 25 words per minute requires a bandwidth of at least 75 Hz for nonfading circuits and 100 Hz for fading circuits. Similarly, for double-side band or two-independent sideband telephony, a bandwidth of 6 KHz is necessary whereas the single-sideband telephony only requires 3 KHz bandwidth. For broadcasting of speech and music bandwidths of 8 to 20 KHz may be required, depending on the quality desired. Fascimile transmissions require a bandwidth of 5.45 KHz or 25.45 KHz, respectively, depending on whether amplitude or frequency modulation is employed.

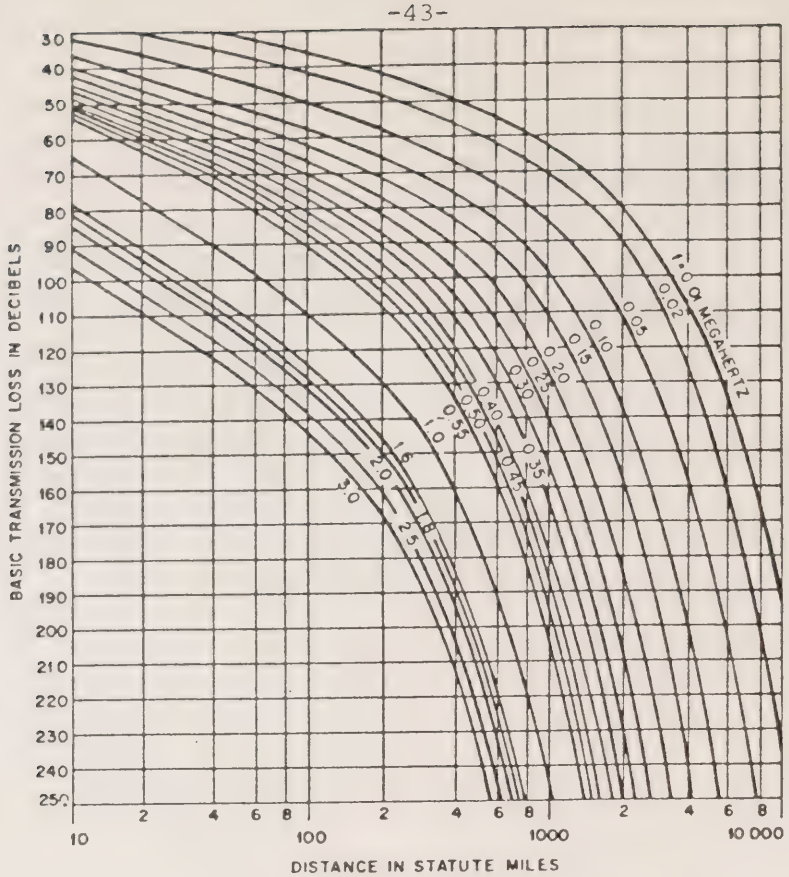
4.1.1 Medium and High Frequencies

The low and very low frequencies are primarily used for maritime radio navigation (e.g. LORAN-C transmissions at 100 kHz are used by ships to locate their positions) whereas medium and high frequency bands find increasing use in long range communications. The MF and HF bands are the primary means in the study area and elsewhere for communicating over distances several times greater than the line-of-sight distance (line-of-sight distance, depending on the heights of the communicating points, is typically less than 70 km).

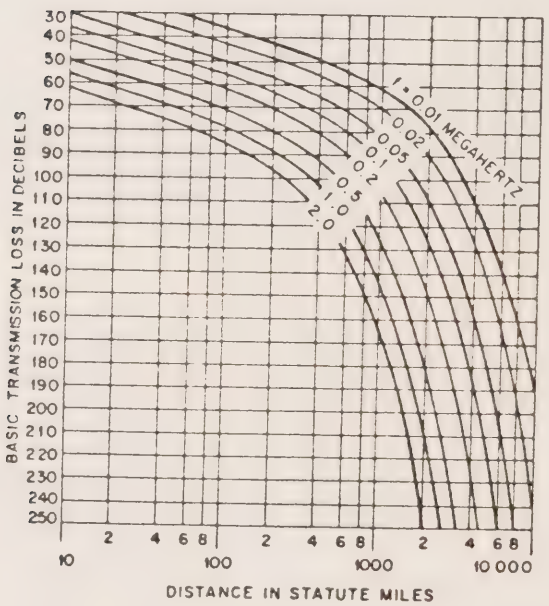
The basic transmission loss, also called path loss, is found convenient for analysis of radio communication systems. Small path losses are required for effective communications. The basic transmission losses for surface-wave or ground-wave propagation over land and sea water are plotted in Figure 10 for low and medium frequencies. These plots are for vertical polarization (relevant to vertical whip antennas commonly used in offshore installations) where both antennas (transmit and receive) are 30 ft (10 m) above the surface. At the stated frequencies, propagation losses for horizontally polarized transmission between antennas (relevant to horizontal wise antennas) on the surface of the earth are impractically high.

Figure 10, which does not include the effect of skywaves reflected from the ionosphere, indicates smaller loss and thus greater distance for transmissions over sea water in comparison with over land. This effect is due to a higher conductivity of sea water (5 mhos/m) as compared with that of land (0.005 mhos/m). Sky waves cause fading at medium distances and produce higher field strengths than the surface wave at longer distances, particularly at night. Sky-wave field strength is subject to diurnal, seasonal, and irregular variations due to changing properties of the ionosphere.

At frequencies between about 3 and 25 MHz (HF band) and distances greater than about 200 km, transmission depends chiefly on sky waves reflected from the ionosphere (Figure 11). The ionosphere is a region



(a)



(b)

FIGURE 10 Basic Transmission Loss Expected for Surface Waves Propagated Over a Smooth Spherical Earth Vertical Polarzation (a) Over Land (b) Over Sea Water (From Reference Data for Radio Engineers, 1972).

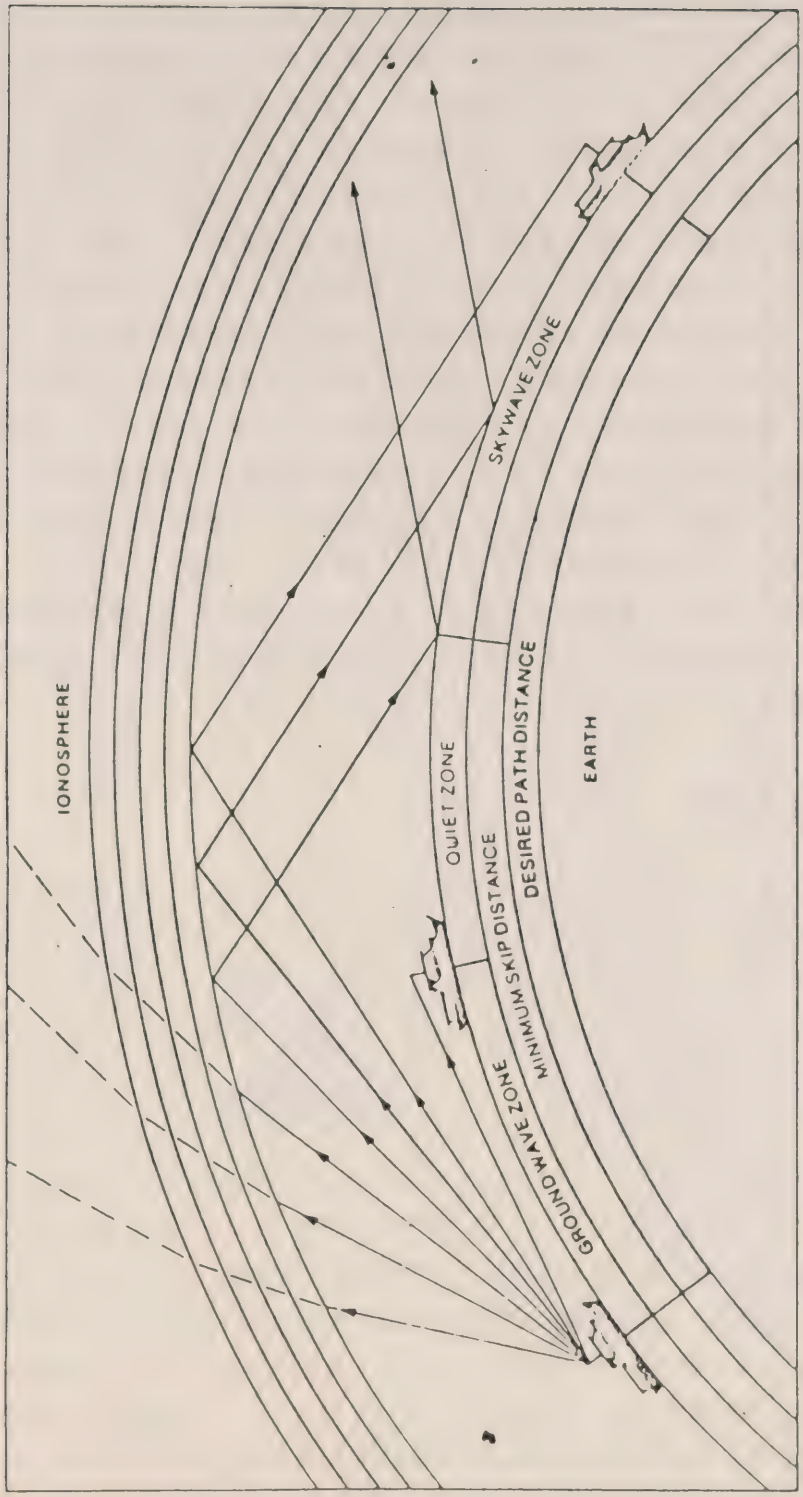


FIGURE 11. Schematic Explanation of Ground-Wave and Sky-Wave (Reflected from Ionosphere) Signal Zones

high above the earth's surface where the rarefied air is sufficiently ionized (primarily by ultraviolet sunlight) to reflect or absorb radiowaves. The ionosphere is usually considered as consisting of several layers at various heights (Layers D - 50 to 90 km, E - 110 km, F_1 - 175 to 250 km, and F_2 - 250 to 400 km). The D and F_1 layers exists only during night and the F_1 layer merges with the F_2 layer during the night at a height of about 300 km. The ionization density (which determines absorption and reflection properties of each layer) for the D and E layers corresponds with the elevation of the sun. In the F_2 layer, the ionization is independent of sun elevation but it and the layer height vary diurnally, seasonally, and over the sunspot cycle. Depending on the ionization density at each layer, there is a critical or highest frequency f_c at which the layer reflects a vertically incident wave. Frequencies higher than f_c pass through the layer at vertical incidence. At oblique incidence, the maximum usable frequency is given by:

$$MUF = kf_c \, Sec\emptyset$$

where, k is correction factor (equal to 1 for short distances) that is a function of distance and vertical distribution of ionization and $\emptyset$ is the angle of incidence at reflecting layer (Figure 12). The critical frequency f_c and height, and hence $\emptyset$ for a given distance vary for each layer with local time of day, season, latitude, and throughout the 11-year sunspot cycle. The various layers change in different ways with these parameters. In addition, ionization is subject to frequent abnormal variations. The E layer is important for HF daytime propagation at distances less than 2000 km and for MF nighttime propagation at distances in excess of about 200 km. The F_2 layer is the principal reflecting region for long-distance communication. The nighttime field intensities (signal strength) and noise generally tend to be higher than during daylight due to the absence of the F_1 layer and reduction in absorption of the E layer.

In medium and high-frequency transmission, the communication bandwidth is limited by multipath propagation. The greatest limitation occurs when two or more paths exist with a different number of hops.

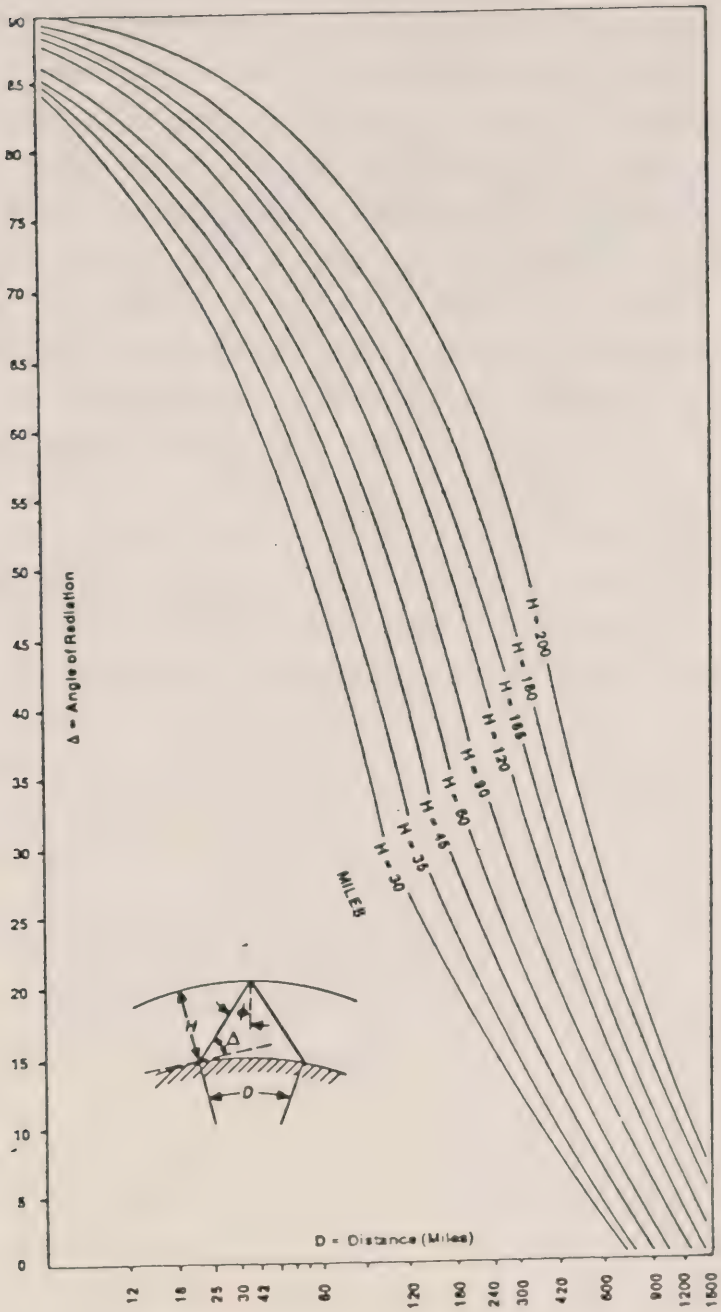


FIGURE 12. Radiation Angle (degree) Vs. Distance As a Function of Ionospheric Reflecting Layer Height

The bandwidth may then be as small as 100 Hz. To obtain bandwidths greater than, say, 1 kHz for paths less than about 600 km, operation at a frequency within approximately 10 percent of the MUF is necessary. The fading of the signal strength due to multipath propagation and ionospheric variations effects communications quality. However, if two or more high frequency radio channels are sufficiently separated in space, frequency, angle of arrival, time, or polarization, the fading on the various channels is more or less independent. This diversity, obtained by using appropriate systems, is commonly employed to improve the overall performance on a single HF circuit by combining or selecting separate radio channels.

A number of programs or procedures are available to predict performance of a HF communication system and to determine optimum frequencies for use (Haagensen, 1981). Petrie and Campbell (1974) have estimated reliability of HF communications links between a drilling vessel and a shore station at various distances in a study commissioned by the East Coast Petroleum operators (EPOA) and the Communications Research Centre (CRC) of the Canadian Department of Communications. Their computed reliability values for sky-wave communications are shown in Table 11 for two orientations of the 35 ft whip antenna on a drilling vessel. These values were calculated assuming a requirement of voice communications with 15 db signal-to-noise ratio in a 3 kHz bandwidth over 24 hours of the day. The circuit was assumed to have available every megahertz (MHz) frequency in the band from 2 to 7 MHz with an additional frequency near 8 MHz for the long-distance circuit. The expected reliability of a ground-wave communications at 2 MHz is shown in Figure 13 which indicates high reliability for over a sea water path for distances less than 300 km during night-time and less than 600 km during day-time.

The MF band contains the International distress and calling frequencies of 500 KHz and 2182 KHz, respectively, for telegraphy (Morse Code) and telephony. To improve the efficiency of the maritime communications services, the Canadian Department of Communications (TRC-11, 1977) only allows single sideband emissions (reduced carrier A3A or suppressed carrier A3J) in all bands below 23,000 KHz (or 23

Circuit	Distance (km)	Month	Reliability (per cent) (a)	Reliability (per cent) (b)
Drilling Vessel-Shore Station	250	June	47	72
		December	82	99
Drilling Vessel-Shore Station	500	June	67	73
		December	78	96
Drilling Vessel-Shore Station	1000	June	74	63
		December	83	94

TABLE 11. Expected Reliability of Sky-Wave Links for Two Orientation of 35 ft Whip Antenna on a Drilling Unit (a) Vertical (b) Inclined 45° from Vertical. (From Petrie and Campbell, 1974).

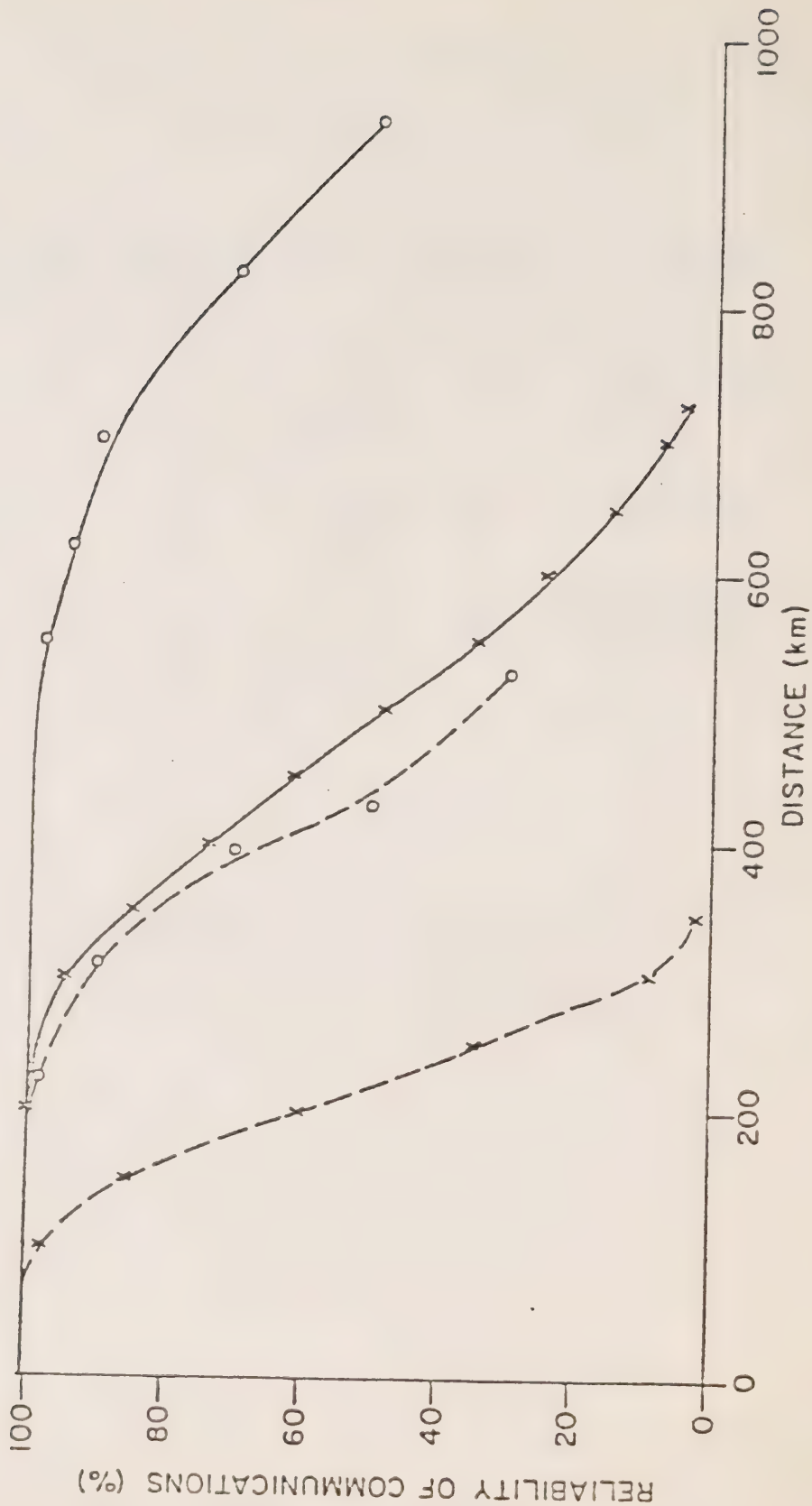


FIGURE 13. Expected Reliability of a Radio Telephone Link Using Ground-Wave Propagation at 2MHZ (From Petrie and Campbell, 1974)

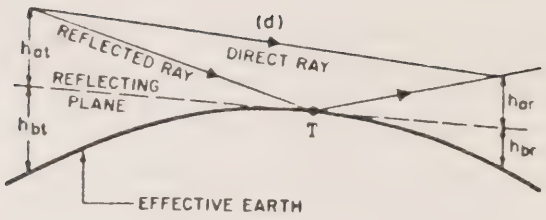
MHz). The double sideband emissions have been phased out. At MF and HF bands, Canadian Coast Guard provides ship/shore communications service through coast stations (Figure 8 and Table 10). Non-safety ship/shore communications can be provided through private shore facilities through proper licensing. Six frequencies in the 2 MHz range of the MF band are available for private ship/shore and intership single sideband communications, on a shared basis between Canada and the United States (Dept. of Communications, TRC-14, 1977). Only 2.8A3A and 2.8A3J emissions are allowed on these frequencies (2.8 is the bandwidth in KHz). Details of the specific frequencies involved in the 4, 6, 8, 12, 16, and 20 MHz bands are also included in the TRC-14 document.

4.1.2 Very High Frequencies

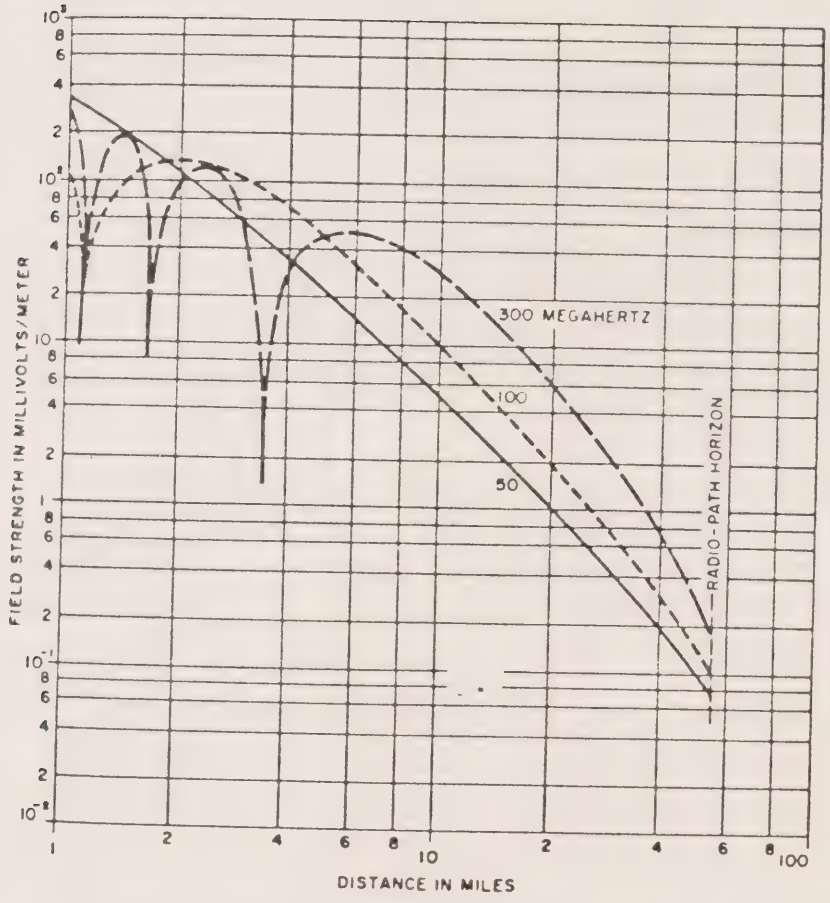
The VHF and higher frequency bands are used for line-of-sight communications. The decrease of the atmospheric refractive index with height, results in the bending of radio rays. Uniform bending may be represented by straight-line propagation, but with the radius of the earth modified so that the relative curvature between the ray and the earth remains unchanged.

The distance in miles to the radio horizon over smooth earth, when the antenna height (in ft) is very small compared with the earth's radius, is given by $(3\ kh/2)^{1/2}$, where K is the effective radius factor (typically about 1.33 in temperate climates, however, values from about 0.6 to 5 are to be expected). The two antennas (transmitting and receiving) at heights of h_t (ft) and h_r (ft) are in radio line-of-sight provided the spacing in miles is less than $(2h_t)^{1/2} + (2\ h_r)^{1/2}$ (assuming K = 1.33). As examples, the radio horizon for a transmitting antenna at a height of 500 ft is at about 34 miles (55 km) while the maximum radio path length with a receiving antenna at a height of 60 ft is approximately 42 miles (67 km).

There are usually two path lengths between a transmitting and a receiving antenna; one, a direct path (free-space wave) and the other, ground-reflected wave (Figure 14). These two rays or waves combine to



(a)



(b)

FIGURE 14 (a) Interference Between Direct and Reflected Rays, and, (b) Variation of Resultant Signal with Distance and Frequency. (From Reference Data for Radio Engineers, 1972)

produce an interference pattern (adding when in phase and subtracting when out-of-phase). The variation of the resultant electric field (signal) strength with distance and frequency (Figure 14) shows increases in field strength as well as severe fading (loss of signal). For transmission paths of the order of 30 miles and for frequencies up to about 6000 MHz (6 GHz), possible increases of signal strength may be up to 10 db with respect to free-space propagation while the fading margin required may be up to 40 db to achieve reliability levels of 99.99 percent. Space or frequency diversity techniques must be employed to reduce signal fading due to reflection multi-paths or atmospheric multi-paths (due to variations in refractive index which introduce relative rapid fading).

The VHF band contains the international distress and calling frequency of 156.8 MHz (Channel 16) for maritime use. Portions of the band of 156 to 174 MHz has been reserved for the maritime mobile service in coastal areas by the Canadian Department of Communications (TRC-13, 1980). Different Channels, with 25 kHz channeling separations, are assigned for intership and ship/shore communications for public correspondence, and for commercial or Coast Guard use. The frequency of 156.3 MHz may be used for communication between ship stations and aircraft stations engaged in coordinated search and rescue operations. Emergency Position Indicator Beacon (EPIRB) being developed is expected to employ the frequency of 156.75 MHz.

The VHF band also contains the frequencies of 243 MHz and 121.5 MHz, reserved, respectively, for survival craft and equipment and aeronautical search and rescue operations. Both are aeronautical distress frequencies. In addition, VHF band is being used for on-board ship station communications provided the radiated power (signal level) does not exceed 1 watt. The VHF aeronautical band allows coordinations of the helicopter movements. The use of VHF band allows employment of small and yet directional antennas. Still smaller antennas are employed at UHF and higher frequency bands. Due to their relatively short range use, VHF transmissions normally utilize powers of 100 watts or less as compared to 500 and 1000 watts for HF transmissions.

4.1.3 Satellites

Satellite communications systems are finding increasing usage and importance in the offshore communications network. A satellite in a geostationary orbits around the earth (36,000 km above the equator) provides a stable relay or repeater station for connecting two points on the earth which are within its view. Thus, the two points separated by a large distance can communicate through the common satellite station which acts as an intermediany (repeater or relay station) and provides a direct access to each point. In recognition of this benefit, a global system of satellites was established by the International Maritime Satellite Organization (INMARSAT) beginning in 1976 to provide global maritime communications (intership and ship/shore). INMARSAT is presently owned by a consortium of 37 countries where the shares of each country is intended to reflect that country's actual usage of the system. Canada has an ownership of approximately 2.6 percent of the shares issued, through Teleglobe Canada, a crown corporation.

The INMARSAT space segment consists of a number of satellites, both operational and spare, deployed over the world's three main oceans (Atlantic, Pacific, and Indian) - together with the tracking, telemetry, command, monitoring and related facilities and equipment needed to support them. Each satellite has a capacity equivalent to about 30 telephone channels. Each can be assessed by a line-of-sight transmission path by a station located within the foot print of the satellites (Figure 15). Two stations located within the same satellite footprint can be connected by a link which is reliable and of very high quality.

The INMARSAT (SATCOM) equipped ships and offshore facilities operating in the Atlantic Ocean region (the coverage only extends up to approximately 70^{o}N as per see Figure 15 for the Satellite footprint) can dial directly into the Canadian public (telephone) network. The ship-to-shore calls are routed via Teleglobe Canada's International Switch in Montreal, Quebec, which in turn is linked to the Southbury, Connecticut, U.S.A. Coast Earth Station (one of three such stations around the world at present).

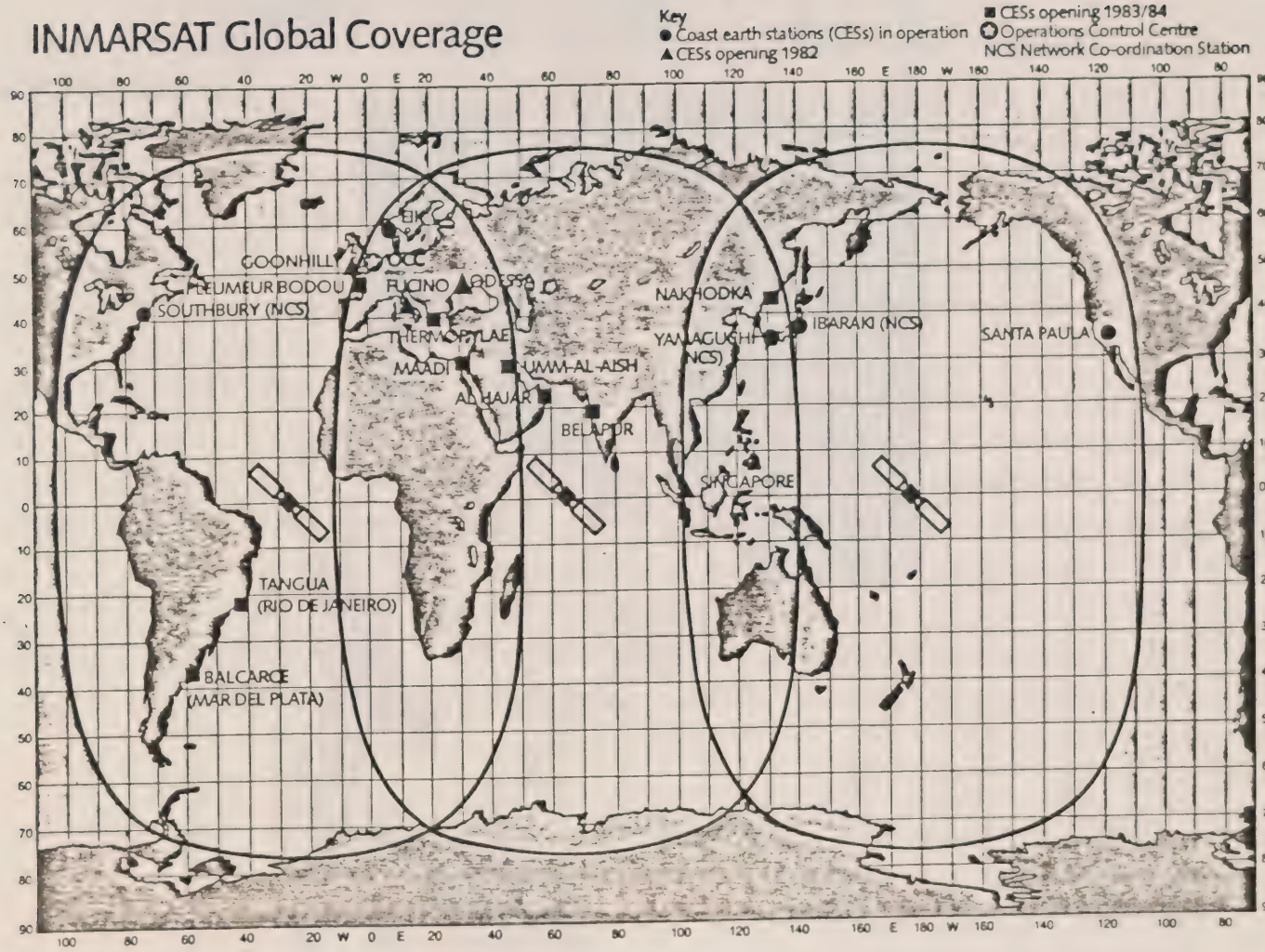


FIGURE 15. INMARSAT Global Coverage (Study Area Coverage Up To Approximately 70°N).

Shore-to-Ship communications (Figure 16) are in the 6 GHz band from coast earth station to satellite and in the 1.5 GHz band from satellite to ship. Ship-to-shore communications are in the 1.6 GHz band from ship to satellite and in the 4 GHz band from satellite to coast earth station.

An INMARSAT ship earth station (sometimes called SATCOM terminal) includes a parabolic antenna of 1.2 m in diameter mounted on mechanical stabilizer with vertical emphasis and contained within a protective radome above deck. The antenna is automatically stabilized and can maintain contact with the satellite with ship rolls of up to 30^{o}. The remaining equipment is contained below deck. The range of services and facilities available from INMARSAT currently include:

i) fully automatic international telex, telegram, and telephone access,
ii) fascimile transmission,
iii) low to high-speed data link (high data rate of 56 Kbps available only ship to shore), and,
iv) distress, urgency and safety communications (distress alerts connected automatically and virtually instantaneously through emergency overide channel on each terminal.

The domestic or Canadian satellites available for offshore communications are the Telesat Canada Anik B, C, and D series. Each of the Anik B and D satellites provides full coverage over Canada, including the offshore drilling area and the Arctic and uses 6/4 GHz bands for up/down links. The minimum antenna size of 4 m needed to communicate at these frequencies, is impractical for installation on non-fixed drilling units. Antenna stabilization is required to maintain a precise antenna orientation with respect to the satellite so as to compensate for the motion of the drilling unit by wind and sea conditions (Table 5). While it is difficult to stabilize antennas of this size, fixed installations such as jack-up rigs and remote base camps can utilize communications services offered by the 6/4 GHz link.

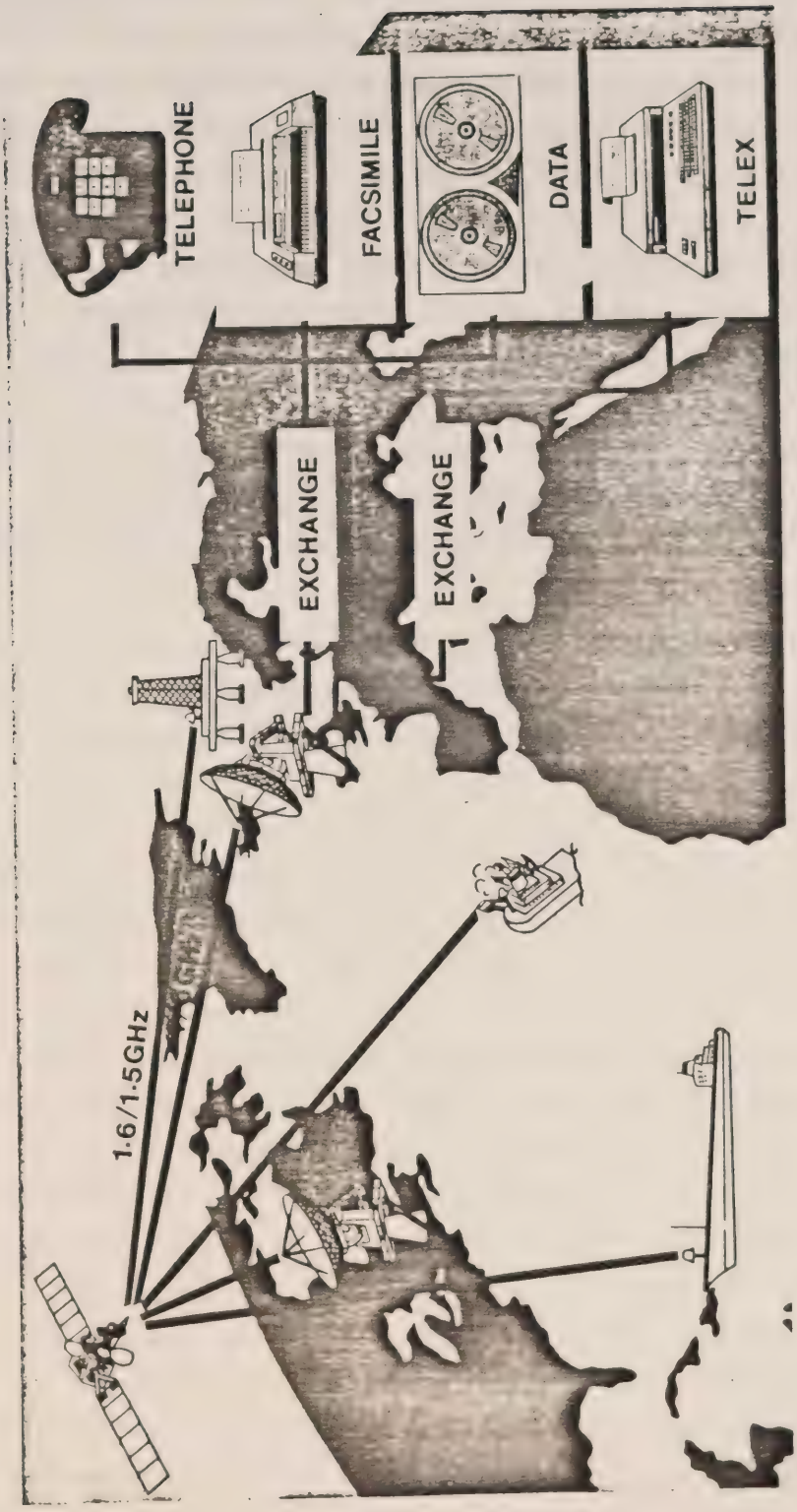


FIGURE 16. Satellite (INMARSAT) Communication Links and Services

Both Anik B and C satellites utilize the 14/12 GHz bands for up/down communication links and employ four spot beams. The coverage includes the entire Atlantic Canada area, with the exception of the northern half of Labrador. Very small (2 m) antennas can be used at these frequencies, providing practical means for access by semi-submersibles and drill ships. Newfoundland Telephone, in partnership with Memorial University, CRC, and Mobil Oil Company, has field tested a prototype 14/12 GHz stabilized satellite terminal and the results are encouraging (Tarrant, 1983). Moreover, the Anik shore earth stations can be at or very near the other shore-based facilities, unlike the INMARSAT shore earth station which is in Southport, U.S.A. and requires extensive land-line circuits up to the maritimes, thus incurring greater costs and possible connection delays.

4.1.4 Emergency

The order of priority for radio communications in the marine service is given to Distress Communications, Urgency Communications, and Safety Communications followed by all other communications. The distress signal ("May Day") is used only when there is an immediate danger of loss of life or property. The urgency communications signal ("PAN PAN") is used only when the safety of a person or a vessel is in jeopardy but there is no immediate danger. Safety signal ("Securite") is used to precede important navigational or meteorological warnings and by vessels approaching narrow intersections or transiting waters to announce their intentions on channel 16 (156.8 MHz) (CCG NR, 1981).

As noted earlier, all ship stations need to be fitted with radio telephone and/or radiotelegraph equipment based on their area of operation. The following International Distress, Safety and calling Frequencies are used:

i) 500 KHz (telegraphy),
ii) 2182 KHz (voice), and
iii) 156.8 MHz (voice).

The 2182 KHz and 156.8 MHz frequencies are primarily used for radiotelephone distress, urgency, and safety calls. However, they may be used for initial contacts and replies with other stations to establish communication following which a change to a working frequency must be made for the resumption of communications. All ship stations equipped to transmit on either or both of these frequencies maintain a listening watch on these frequencies (voluntarily or by law). All stations fitted with 2182 KHz unless in a distress situation must maintain radio silence while guarding 2182 KHz for three minutes twice each hour. Ship station radio installations require storage batteries to supply emergency power for continuous 6 hour operation while COGLA regulations require a back-up power for 24 hour operation.

All compulsory fitted vessels must carry a portable lifeboat radio apparatus which is usually fitted with the following frequencies:

Transmit 500 KHz (telegraphy), 2182 KHz (voice), and 8364 KHz (telegraph),
Receive 500 KHz (telegraphy), 2182 KHz (voice).

This radio apparatus is capable of transmitting the following signals automatically (Canadian Department of Communications, Atlantic Region Guide to Marine Telephone Operation):

a) International Radiotelegraph Auto-Alarm System

Signal is automatically transmitted prior to the distress signal and consists of twelve dashes, four seconds in duration separated by one second between dashes. When this signal is transmitted, it activates an "automatic alarm receiver" fitted in deep sea vessels which generally should receive the signal within a radius of up to 100 miles (160 km).

b) Radiotelegraph Distress Signal

It (SOS letters three times in Morse Code followed by two long dashes) is capable of being transmitted automatically (or manually) on the 500 KHz or 8364 KHz frequency following the radiotelegraph auto-alarm signal. The two long dashes are for direction finding purposes. Most portable lifeboat radios can receive on 500 KHz but not on 8364 KHz.

c) International Radiotelephone Alarm Signal

In most portable lifeboat radios it is usually transmitted automatically on the frequency 2182 KHz and should last thirty to sixty seconds. This signal, for the most effect, is sent during the silent periods at the hour and half hour and followed by spoken radiotelephone distress message.

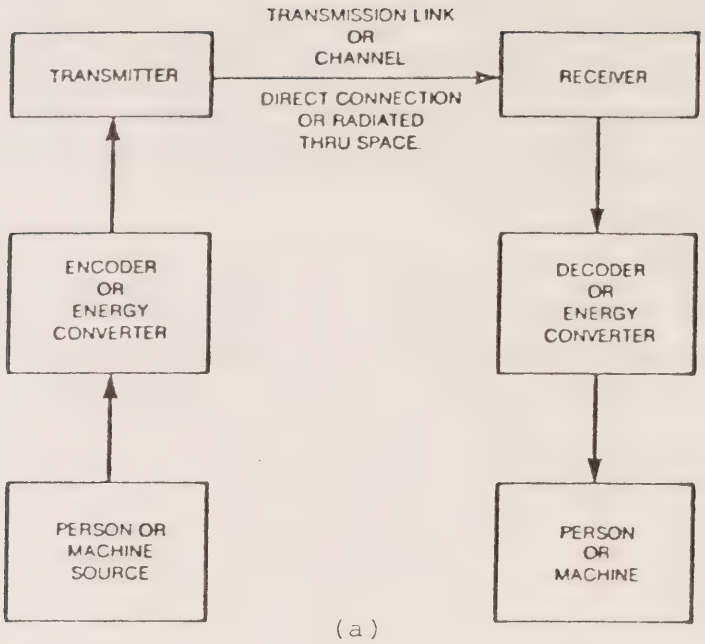
Some towing vessels are required to carry an Emergency Position Indicating Bouy (EPIB) which is radar reflective and designed to float free if the vessel sinks. The buoys are equipped with a radio transmitter capable of automatically transmitting on 121.5 MHz and 243 MHz (Aeronautical Distress Frequencies). Ship radio equipment is generally not fitted with a receiver to monitor 121.5 MHz which is in the VHF "aeronautic band".

Lead acid storage batteries are used extensively as a source of primary and/or emergency power for radio telephone equipment. Details of records of their maintenance and charging need to be kept. In addition to ship stations, Coast Guard Stations (Figure 8) maintain a continuous listening watch on emergency frequencies 2182 KHz (Channel #51), 156.8 MHz (Channel #16) and 500 KHz for distress, urgency and safety calls.

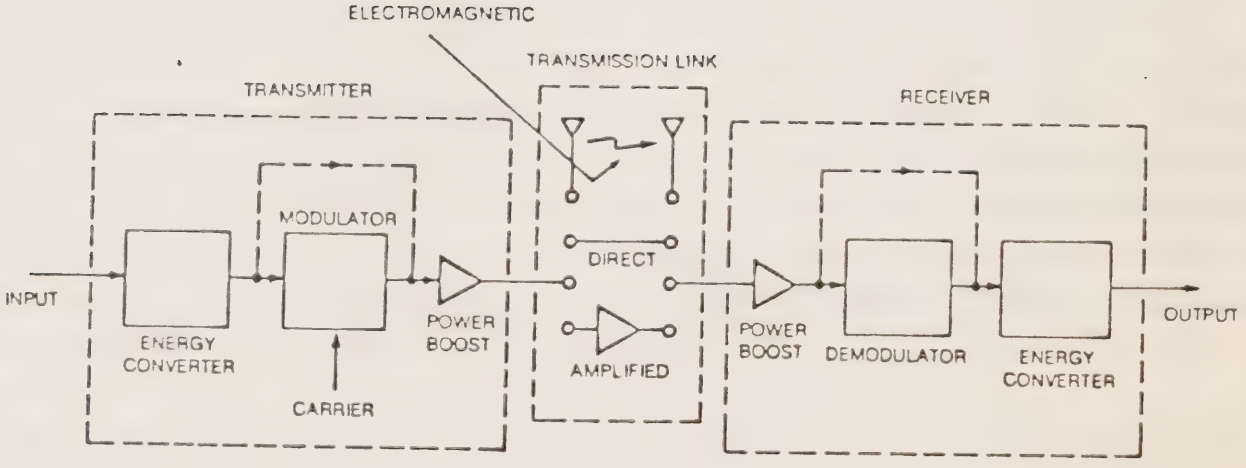
4.2 Communications Systems

The main elements of a communications system (Figure 17) are: energy converters (encoder and decoder), a transmitter, a receiver, and antennas (one for transmitting and one for receiving). The energy converter, as the name suggests, converts one form of energy into another (e.g., voice into electrical fluctuations or pulses and electrical pulses into voice as done by a microphone and a speaker, respectively). During the transmission phase, the electrical pulses (in the form of voltage or current fluctuations) are used to modulate a carrier wave of desired radio frequency (HF, VHF, etc.). Modulation is a process whereby certain characteristics (amplitude, frequency, or phase) of the carrier wave are varied in accordance with the message signal (electrical fluctuations from encoder). The carrier wave signal is provided by the transmitter and the modulated signal is generally boosted to desired power levels before transmission.

The modulated signal may be transmitted directly through a cable (as done in land-based telephone circuits) or through the atmosphere by propagation of electromagnetic waves. An antenna is used to radiate the transmission signal into space and another antenna is used at the



(a)



(b)

FIGURE 17. Communications Systems, (a) Main Elements and (b) System Configuration

receiver site to capture this radiation. The received modulated signal is amplified, demodulated, and converted back into the desired form (e.g., voice). The process of separating the modulating signal (message signal) from a modulated carrier wave is called demodulation or detection.

Three forms of amplitude modulation and frequency modulation are generally employed in offshore communications (Table 9). In amplitude modulation (AM), the frequency components of the modulating signal (e.g. voice with a typical associated frequency range of 300 Hz to 3000 Hz) are translated to occupy a different position in the spectrum. In conventional AM, the frequency spectrum of the modulated wave consists of a carrier frequency component, frequencies given by the addition of carrier frequency and frequency components of the modulating signal (known as upper sideband), and frequencies given by the subtraction of carrier frequency and frequency components of the modulating signal (upper sideband).

If, the carrier frequency component is suppressed from the AM waveform, the resulting Double-Sideband suppressed carrier (DSB-SC) signal is obtained. When the upper side band and carrier are completely removed from the conventional AM signal, a single side band (SSB) signal with suppressed carrier is achieved. As it carries all the necessary information contained in the message signal (due to containing all the frequency components of the modulating signal), the SSB is the preferred mode of communication where frequency spectrum needs to be preserved as when there are many users (SSB only requires half of the bandwidth needed for DSB).

The SSB communications offers several other advantages as well; e.g., relative immunity from selective fading, reduced noise, and reduced radiated power levels for a given effective signal strength. The frequency modulated (FM) communications in which the instantaneous frequency of the modulated signal is proportional to the modulating signal amplitude, provide even better signal-to-noise ratios than the SSB transmissions.

Some other aspects of a communications systems which influence its performance are the antenna characteristics, transmit power levels, and number of channels available. The most common antennas used in offshore installations are whips and wires which offer little or no gain and directionality. The power levels are dependent on frequency of operation and desired range and may vary from tens of watts to several kilowatts. A multi-channel capacity is normally available. All the communication hardware must meet standards in accordance with the Canadian regulations, approval before installation, and need to undergo yearly inspections.

An operational communications system is shown in Figure 18 indicating the possibility of controlling two drilling units from one base (e.g. located in St. John's) or the option of communications with two land stations from a drilling unit. A summary of communications systems used in the study area based on responses to our questionnaire is provided in Table 12. A drilling unit is usually equipped with one or more MF/HF circuit, one VHF marine circuit and one VHF aeronautical circuit for external communicatioins. In most cases, two independent MF/HF circuits are practically available; one to handle telex/telecopier, and the other to handle voice communications with the shore stations. Two circuits are provided so that one can act as a back-up; usually voice and telex messages are handled on the same circuit depending on level of traffic.

The MF/HF circuit is designed to operate in the frequency range from 1 to 30 MHz. Usually up to six private transmission frequencies arer assigned by the Department of Communications; generally at least one in each of the 2,4,6 and 8 MHz bands. The 2 MHz band may have two assigned frequencies. Two transmitters are normally available, each with a separate exciter which are remotely controlled. The main transmitter usually has a transmit power rating of 1 to 1.5 kw while the second transmitter, intended as a back-up, has a lower power rating typically around 400 w. Back-up or emergency power is provided for only operating the secondary transmitter over periods ranging from 20 to 40 hours. The transmitters can provide all the necessary emission types, ranging from single side band to AM modulted, if

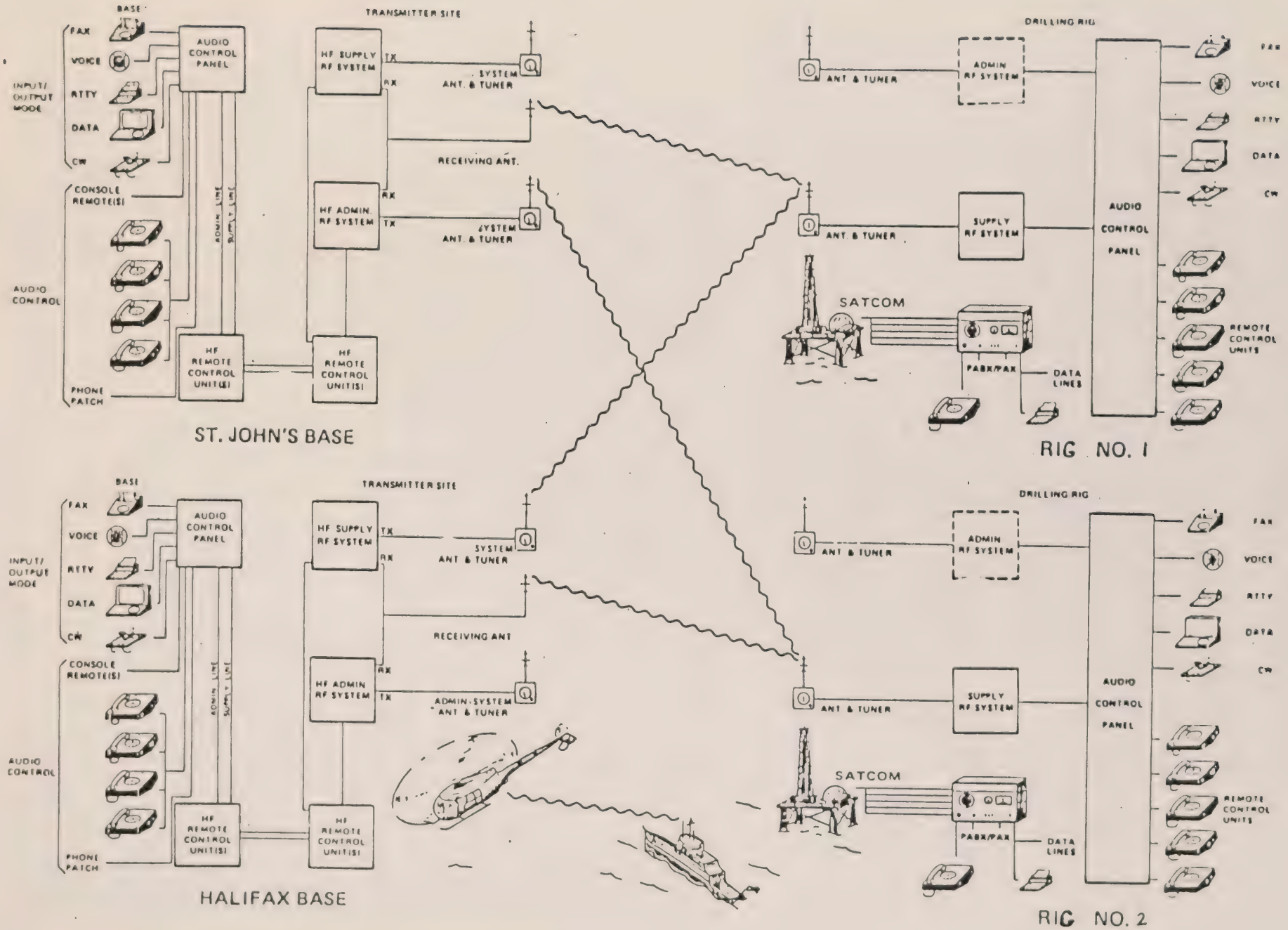


FIGURE 18. An Example of Offshore Communication Systems

Installation	Frequency Bands	Equipment			Operator		Traffic
		Band	Power out (W)	Emergency Power (Hrs.)	Yrs. Exp.	No. of Operators	
Base	6 Private HF	HF HF HF	125 1000 1000	10 (Battery)	2- 5	2	Medium
	8 Private HF	HF HF HF	125 1000 1000	Unlimited (Diesel)	1- 4	4	Medium
	7 HF 3 MF 3 VHF	HF MF VHF	1000 500 100	Unlimited (Diesel)	1-36	8	Heavy
	7 HF 3 MF 3 VHF	HF MF VHF	1000 1000 100	Unlimited (Diesel)	6-30	5	Medium
Drill Unit	4 Private HF VHF-M VHF-A	HF HF VHF-M VHF-A	600 200 25-1 10-1	20 (Battery)	1-20	2	Heavy
	8 Private HF VHF-M VHF-A	HF HF MF VHF-M VHF-A	150 400 400 25-1 20-1	5 (Battery)	1- 2	2	Heavy
	6 Private HF VHF-M VHF-A	HF HF VHF-M VHF-A	400 400 25-1 40-1	40 (Battery)	1-4	4	Heavy
	5 Private HF VHF-M VHF-A	HF VHF-M VHF-A	400 20-1 14-1	20 (Battery)	1.5-2	2	Heavy
Support Vessel	7 Private HF VHF-M	HF HF HF VHF-M VHF-M	400 100 100 25-1 25-1	40 (Battery)	1- 5	3	Low
	4 Private HF VHF-M	HF HF HF VHF-M VHF-M	400 400 100 25-1 25-1	20 (Battery)	1- 5	3	Low
Helicopter	VHF-M VHF-A HF	VHF-M VHF-A HF	5-1 20 150	-	-	-	Low
	VHF-M VHF-A	VHF-M VHF-A	5-1 20	-	-	-	Low
	VHF-M VHF-A HF	VHF-M VHF-A VHF-A HF	5-1 20 20 150	-	-	-	Low

TABLE 10. Examples of Typical Communications System Parameters in the Study Area (HF band includes MF band, Private Frequencies are in Addition to Public Frequencies).

required. Each transmitter has multi-cahnnel (6 to 50 channels) capability available (referred to as a synthesizer) with auto-selection and tuning. Thus, the channel frequencies can be programmed in advance and called for use when needed. In some systems, the transmit channels are automatically scanned and a particular channel selected to suit the prevailing environmental conditions.

A drilling unit has more than one single selectable channel receivers operating at 300 KHz to 300 KHz range. Again, a number of channels can be programmed in advance and continuously scanned to indiicate active channels. The status of active channels is indicated by visual and audio alarms. The receivers have very good sensitivity (typically 0.1 Uv for a s+n/n of 10 db) and some are equipped to suppress interfering noise automatically.

The drilling units usually has three MF/HF antennas; two vertical whips, each typically 35 feet long, and a wire antenna. The whips are provided with remote auot-tuning capability. One whip is usually intended to act as a spare or back-up. The antennas are fitted on the top deck of the drilling unit away from any tall, interfering structure. The remaining equipment is placed in the radio room which is usually on the second deck, right underneath the antenna location. The location of the radio and antennas varies from drilling unit to drilling unit. In drilling ships (dynamically positioned), the radio equipment is placed in the wheel-house or bridge. In semi-submersibles the radio room is fairly well integrated with other business related office activity.

The radio room on drilling units is fitted with panels containing thumb wheel and other switches which provide selections of different antenna, receiver, and transmitter combinations by the radio operator. Other equipment includes that which is necessary for maintaining listening watches on distress frequencies (e.g. watches indicating silent periods), VHF marine radio, aeronautic HF and VHF transreceivers, and the SOLAS HF telegraph transceiver, a non-direction beacon, an automatic direction finder, portable life boat SOLAS equipment, and equipment needed for internal

communications. The VHF marine radiotelephone system usually is a transreceiver with transmit power capability of less than 100 watts and which has up to 50 channel capability. A whip antenna is used with automatic tuning capability; a spare antenna is usually provided. The VHF aeronautic radio telephone system is similar but with fewer channels and no spare antenna is normally provided.

The internal communications services provided on a drilling unit ususally include the following:

- Audio and visual public address systems and alarms
- Internal telephone communications with patching to the external links
- A separate VHF radio system (using portable equipment) for crane cab communications to provide safe communications between cranes and supply boats.

Additionally, a VHF paging service may be provided along with a separate drillers intercoom. Emergency locator beacons (121.5 MHz and 243 MHz frequencies) are provided for the rig and lifeboats. Lifeboats contain a full complement of SOLAS convention equipment.

It is a common practice to fit a shore-station with equipment identical to that provided on a drilling unit which is essential for external communications. This includes MF/HF and VHF marine/aeronautic transreceivers. Thus, the equipment installed on a shore-station may consist of 500 to 1.5 kw transmitters (linear power amplifiers) connected to one or more antennas which differ from station to station. Separate receivers tuned to each of the assigned frequencies are installed at most stations and they are connected to either a common transmit-receive antenna or a separate receiving antenna. The following types of antennas (Petrie and Campbell, 1974) are used for transmission and reception:

a) Single horizontal dipole (wire) mounted about 50 ft (17 m) above ground and tuned with an antenna matching unit to operate on several frequencies;

b) Several half-wave dipoles with a common feed point which is located about 20 ft (7 m) above ground; these are designed to operate on several frequencies;

c) Several half-wave dipoles mounted about a quarter-wave length above ground, each for operation on a specific frequency; and

d) A single vertical monopole about a quarter-wave in length with a ground screen designed to operate on an assigned frequency near 2 MHz.

The purpose of an extensive antenna installation at a shore-station is to compensate for the short-comings of antennas fitted on a drilling unit. On a drilling unit space is limited which means that only a few antennas can be used. Moreover, due to the changing orientation of a drilling unit, a vertical whip which provides omni-directional radiation pattern is preferrable. In contrast, the shore-station antenna installations can be optimized, i.e. improved gain and directivity characteristics are achieved. Because of its possible large extent, a shore-base antenna installation is usually provided in a remote location with controlling and information transfer capability from a business office available through land lines or cables or a VHF link. The business office itself may also be equipped with a vertical whip and wire antennas which may act as a back up. In addition, the business office may be connected to a dock office which may have an additional set of antennas to monitor activities of support vessels.

The support vessels are filled with equipment similar to that available on a drilling unit. These contain a VHF marine circuit and a MF circuit or an MF/HF combined circuit. The transmit powers for HF installations vary from 100 to 400 and those for VHF equipment is typically around 25 watts. Again, vertical whip and horizontal wire antennas are used with whips being more common. The antenna lengths are usually less than 10 m and a spare antenna is often provided The radio equipment is placed on the bridge.

Helicopters are usually fitted with one VHF-AM (aeronautical band at 122 MHz or 123 MHz) transreceiver and sometimes, in addition, one

VHF-FM (marine band from 156 to 174 MHz) transreceiver. The VHF marine transmitter usually has a high power of 5 watts and a low power of 1 watt while the aeronautic transmitter has a 20 watt power. Some helicopters may be fitted with an additional aeronautic band VHF radio and/or an HF transreceiver. All these circuits are provided for voice communication.

It appears that two components belonging to two separate networks do not have a common private frequency assignment for exclusive use. However, any two components of two different networks can communicate with each other through frequencies designated for public correspondence. For example, the VHF marine bands contain no private frequencies, and thus several frequencies are designated for public use (ship/shore and intership communications). Similarly, several frequencies are designated for public correspondence in the MF/HF bands. The usual practice is to utilize the internationally designated distress and calling frequencies (e.g. 2182 KHz and 156.8 MHz, 500 KHz) to establish communications and once a particular link is established to switch to a frequency mutually agreed upon. At least these frequencies are continously monitored by offshore users and equipment of sufficient flexibility is available to monitor other public correspondence frequencies. It is also possible to establish contact through using the Coast Guard stations as intermediators. These stations can also assign a frequency for temporary use by two private parties.

Due to the possible sensitivity of the information communicated in an exploration drilling, it is common to use scramblers to achieve secure and confidential circuits. As noted earlier, equipment is installed to transmit and receive teletype and telecopier messages between a drill unit and a shore station. The teletype machines use established techniques or procedures to achieve low error rate in message transmission or reception due to long propagation paths which at MF/HF bands may significantly affect the message quality (signal to noise ratio). Several methods such as Forward Error Correcting (FEC) and Automatic Request for Repetitions (ARQ) are used in commercially available equipment. All the ship station installations comply with

the Canadian and at least the SOLAS conventions while all the shore stations meet the Canadian regulation standards. This ensures the adequacy of radio operator certificates (Canadian authorities are in a process of revising requirements, especially applicable to mobile offshore drilling units).

It appears from responces to our questionnaire and from our own observations that significant delay may sometime occur in affecting repairs to communication equipment. Moreover, the unavailability of qualified technicians may result in equipment downtime. No preventive or regular maintenance schedule is apparently followed and repair logs are not being kept. In addition, performance or diagnostic monitoring equipment is not in use. Electronic equipment can degrade or fail, and it should be subject to regular preventive maintenance routines. Performance monitoring is not a substitute for preventative maintenance, but can be a part of it.

5.0 ASSESSMENT OF STUDY AREA MEANS OF COMMUNICATION

5.1 Possible Causes of Failure

The conditions which could result in the failure or break-down of an external communication link are:

i) extremely adverse environmental condition,
ii) equipment break-down,
iii) power failure, and,
iv) electromagnetic interference.

The pertinent environmental conditions are heavy precipitation (rain or snow), high sea states (ocean waves induced by winds), and the presence of extensive sea ice along the communication path. The occurence and severity of these conditions in the study area have been given in Tables 1 to 4. These conditions affect the communication quality (signal-to-noise ratio) and, thus, determine the reliability (percentage of time a particular signal-to-noise ratio is exceeded) of a particular communication link. The occurrence of thunderstorm conditions in the study area can be as much as 3 to 4% in an extreme month, or approximately less than 24 hours in a month. The maximum percentage frequency of gale force winds (greater than or equal to 34 kts) in a month is about 8 which corresponds to a duration of approximately 48 hours. Storms (winds of 60-70 kt) in the study area average once a year and may last for several days.

Equipment break-down or failure may occur due to a faulty component and when a spare is unavailable. Lack of a spare component, and the delay in obtaining it, is apparently a common occurence. The lack of spares is perhaps an indication of short comings in preventative maintenance and in the keeping of records on equipment failures and repairs, which aid in determining preventative maintenance schedules and spares requirements. In some other instances equipment repair may not be possible without expert help due to the difficulty of even identifying the source of a problem or localization of a fault.

The power failure is less of a problem due to the availability of back-up or emergency power from storage batteries. The emergency power, although of limited wattage, is designed to last from 20 to 40 hours depending on the installation. Similarly, electromagnetic interference due to emission from other sources is not a major problem in the study area as yet due to the present limited exploration activity in individual regions. A substantial increase in communications traffic or spectrum congestion due to an increase in exploration activity may pose problems in the future. Significant electromagnetic interference is obviously possible during a war situation or due to a deliberate attempt of an enemy (e.g. through jamming). It should be noted that there are some other conditions (e.g. variations in the ionosphere which result in signal fading) which obviously affect communications quality or reliability. These conditions determine the inherent reliability of a communication link and, thus, are not included in the four external causes for a link break-down identified earlier. These conditions though may equally result in the failure of a communication link which may last from few minutes to several hours.

The main conditions which result in the failure of an internal communications link on a drilling unit are equipment break-down and power failure. Intrinsically safe equipment (e.g. fire proofed, hand-operated telephones) offer obvious advantages. The noise level at a particular place may prevent comprehension of voice communications some times, which makes desireable the use of visual alarms during emergency situations, in addition to audio alarms.

5.2 Assessment

It is desireable that communications links among components of a "drilling system" be maintained all the time (at least communications between two components be possible when required); i.e. there should be no break-down in the offshore communication network. The typical operational reliability of MF, HF, and VHF links employed by communications users in the study area during day, night, or storm conditions is summarized in Table 13. These values are largely based

Frequency	Day	Night	Storm
2 Mhz	90	40	10
4 Mhz	90	90	15
6 Mhz	85	30	20
8 Mhz	90	75	50
Above 10 Mhz	85	10	10
VHF-FM	95	95	85
VHF-AM	95	95	75
SATCOM	99	99	99

TABLE 13. Typical Operational Reliability (percentage) of Various Communications Links in the Study Area

on responses from the questions sent to offshore exploration companies and the coast guard, and are in general agreement with those available in the literature.

The VHF and higher frequency (e.g., UHF) links used for line-of-sight distances are inherently highly reliable. The VHF band is immune to most atmospheric noises and due to its line-of-sight limitations is relatively interference free. Thus, reliable communications extend approximately to 75 km with coverage frequently extending to 90 km. The VHF coverage areas of coast guard stations depicted in Figure 8, extend up to a distance of 40 miles (64 km) offshore. Infrequently, temperature inversions in the atmosphere may produce skip conditions for short periods, extending up to a few days, during which VHF communications can occur even up to a distance of 400 km.

As noted before, the MF and HF frequency bands used for medium to long range communications between ship and shore stations are inherently less reliable than the VHF links. These bands are subject to severe atmospheric disturbances during abnormal weather conditions. The ground wave mode of communications is normally more reliable than the sky wave mode. During severe environmental conditions such as lightning, rain and wind storms, the band is subject to heavy static and other noises. The noise may be severe enough to reduce the effective coverage of the coast guard stations. The station coverage may be further reduced during night when noise from sky wave is added to the ground wav noise. The MF coverage area of coast guard stations (Figure 8) extends to only 150 miles (240 km) offshore, perhaps indicating the range of reliable MF communications.

To deduce the effect of high winds on offshore communications using MF and HF ground waves, signal to noise computations were performed by Mr. Barry Dawe, a post-graduate engineering student at the Memorial University of Newfoundland (MUN) under Professor John Walsh's direction. These computations were performed using an attenuation function computer program available at MUN. The ratio of

power received, P_r, to transmit power, P_t, over a communication path is given by

$$\frac{P_r}{P_t} = \frac{4\lambda^2 G_r G_t |W|^2}{(4\pi)^2 R^2} = TL$$

where, G_r and G_t are, respectively, the antenna gains of the receiver and transmitter, λ is the wavelength, R is the range or distance, and W is the attenuation function. Signal-to-Noise ratios (S/N) and communication reliability results obtained for typical MF and HF frequencies used in the study area are given in Table 14. The S/N values at the receiver output were assumed to be equal to the signal-to-noise ratio at the receiver input (i.e., receiver noise and antenna losses were neglected). Thus, the S/N values given in Table 14, correspond to P_r/N values, where P_r was computed from the above equation for a transmit power of 1000 watts (1 kw). The values of noise, N, were taken from the reference man-made noise data contained in the International Radio Consultative committee (CCIR) Report No. 258.4. The specified noise values for rigs are those for heavy industrial locations, which are significantly higher than for a non-industrial shore location. The atmospheric noise data obtained from the CCIR Report No. 312 indicated that the S/N values given in Table 14 may be degraded during summer conditions by an average of 6 db.

The results shown in Table 14 were obtained by assuming a $\lambda/4$ (quarter wave) whip antenna at a frequency of 7.48 MHz providing a directive gain of 5.15 dB. The antenna gain was degraded with frequency by assuming the gain of a unit dipole to be 1.70 dB. The shore based installation was assumed to be at an elevation of 600 ft containing two $\lambda/4$ whip antennas at 7.418 MHz spaced $\lambda/2$ apart, which provided a combined gain of 8.15 dB (3dB increase in gain over a simple element). As antenna values correspond for perfect ground, a 2 dB ground loss was assumed. The attenuation function was calculated using the MUN software while the modified surface impedance values

MF/HF Band Frequencies (MHZ)	Background Man-Made Noise ($x10^{-12}$ W)		Wind (kt)	S/N (dB) at Distance		Max Distance (km) For Telex Communication (S/N = 2dB)
				300 km	450 km	
	Rig	Shore				
2.398	42	5	10	50	40	1109
			30	15	-6	450
			50	10	-16	380
3.396	16	2	10	50	40	993
			30	27	9	502
			50	3	-20	296
4.588	7	1	10	50	39	947
			30	18	-8	383
			50	-17	-42	177
5.390	5	.5	10	49	37	881
			30	15	-11	366
			50	-17	-43	190
6.855	2	.2	10	42	25	663
			30	2	-25	295
			50	-10	-38	233
7.418	2	.2	10	40	23	626
			30	-3	-31	267
			50	-9	-38	236

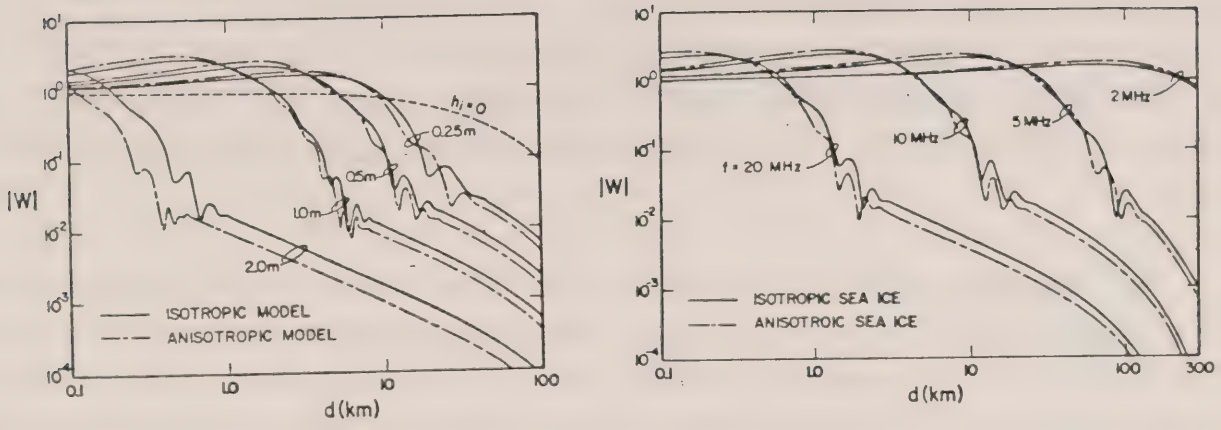
TABLE 14. Estimated Signal-to-Noise Ratio (S/N) For Shore to Rig Communications at Typical MF/HF Frequencies (Needed S/N for Reception Quality; Broadcast greater than 38dB, Intelligible Voice greater than 14dB; Telex greater than 2dB)

were computed using a method, developed by Mr. S. Srivastava, (also a post-graduate engineering student at MUN), which is comparable to that available in the literature.

The results of Table 14 indicate that, theoretically, voice and telex reception quality for transmissions at 2 and 3 MHz, using ground-waves, is adequate for distances up to 450 km under winds of up to gale force intensity (approximately 34 kt). This is true assuming that the criteria used be of signal to noise ratio exceeding 14 db for teletype or telex messages. The maximum range, at 50 kt winds (significantly less than the expected storm force winds of 60-70 kt) for telex quality reception (signal to noise equal to 2 db) is 380 km and the maximum range for voice quality receptions is expected to be significantly less than this. The maximum range values of Table 14 were obtained by determining the ratio W /R required to meet a given signal to noise ratio (2db in this case) and subsequently determining R (range) which would satisfy this ratio using the spherical earth attenuation program available at MUN (W is also a function of R).

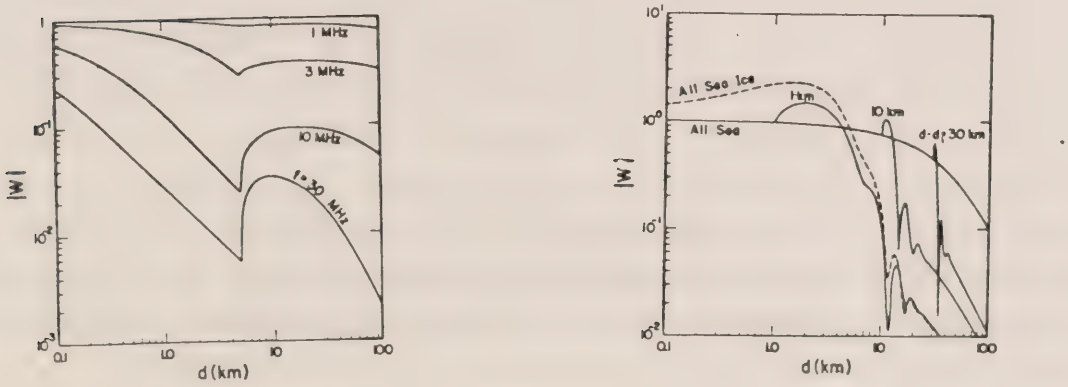
The path or transmission losses at distances of 300 km and 450 km, respectively, ranged in values from 84 to 160 db and from 93.5 to 186 db. The corresponding values of the attenuation function ranged from 0.4 to 1.9 X 10^{-4} and 0.2 to 8 X 10^{-6} (smaller values mean smaller signal strengths at the receiver).

The variations in the attenuation function (both magnitude and phase) for transmissions over sea ice and over mixed sea to sea ice paths with variations in distance, frequency, ice thickness, and elevation have been studied by Hill and Wait (1981a and b). Examples of their results are shown in Figures 19 and 20 which indicate that at a frequency of 2 MHz transmissions over a sea ice path may even be beneficial. However, at higher frequencies the value of attenuation function may be comparable to those obtained for gale force winds, thus, significantly reducing the effective communications range and affecting link reliability.



(a) (b)

FIGURE 19. Magnitude of the Attentuation Function as a Function of Range (a) for Various Sea Ice Thicknesses h_i at 10 MHZ and (b) for Various Frequencies at (h_i=0.5m) (From Hill and Wait, 1981a)



(a) (b)

FIGURE 20. Magnitude of the Attenuation Function for (a) Land-to-Sea Path for Various Frequencies (Land Distance = 5 km) and (b) Sea-to-Sea Ice Path for Various Lengths of the Sea Section ($d-d_1$=1,10,30 km)

(From Hill and Wait, 1981b)

In summary, the practically effective and reliable range of a VHF links appear to be about 80 km and those of MF or HF links, which principally use ground-wave made of propagation, to be up to approximately 350 km. Considerably larger distances are possible with sky-wave mode of propagation but those links must be considered less reliable. Satellite communication links are inherently highly reliable.

The drilling units operating in the study area have channel redundancy within a frequency band and practically all employ frequency band redundancy. Almost all drilling units have satellite communications terminals. Moreover, the communications equipment onboard the drilling unit normally includes redundant antennas, transmitters and receivers at least for the prime communication link with the shore-base. This link for operations on the Grand Banks and those on the Scotia Shelf is provided by MF/HF band frequencies. In such operations, the adequate reliability is only maintained by the provision of satellite communications facilities which also provide immediate access, emergency override, capability. The operations within approximately 80 km of Sable Island on the Scotian Shelf have access to the satellite station located on it through a reliable VHF link.

A helicopter flying at heights of 300 to 500 m can maintain VHF communications with ground stations for distances up to 100 km. Thus, while transversing a distance of 500 km (e.g. between a shore-base and a drilling unit), it is in contact with a ground station for about half the distance using the VHF link. It is only for the middle half distances that it may have to utilize the HF link, if so required. At speeds of about 150 km per hour, this implies a lower communication reliability for a period of about 2 hours.

The above discussion related to helicopter communications is applicable to support vessels as well. While a support vessel is travelling between a drilling unit and a shore-base apart at a distance of 500 km, it is out of the reliable or effective range of the VHF marine link for about two thirds of the distance in the

middle. At a speed of about 10 knots, this means that it has to rely on MF or HF communications for less than 15 hours.

The distress link at 500 kHz is very reliable and when provided, emergency communications are possible at any time. Due to the low power, life boats may provide very short range (5 - 10 km) service on 500 kHz.

The possibility of communications between various components of two nearby networks is readily apparent. At both MF/HF and VHF marine band frequencies a number of public correspondence intership or ship/shore frequencies are available. Moreover, a communication link can be established by using the international distress or calling frequency and then subsequently switching to a working frequency.

Thus, the offshore communications in the study area at present are practically reliable and appear to be adequate to meet the needs of exploration companies. This reliability can be enhanced by following a frequent preventive maintenance schedule for the communications equipment and a required provisioning of basic spare components. In addition, it would be desireable to have available, at least with the drilling unit, a qualified technician capable of repairing communications equipment. A communications contingency plan should be prepared and made available to radio operators outlining the procedures for using communications equipment in the event of a link breakdown following the causes stated in the preceeding section.

6.0 OTHER COMMUNICATIONS SYSTEMS

6.1 Other Offshore Areas

Other offshore areas employ communications systems similar to those being utilized in the study area. As noted earlier, exploration activities in most other offshore regions are being undertaken in areas close to the shore (distances less than 100 km). This means that the VHF band is the prime means of communication. For example, in Beaufort Sea operations both VHF and HF bands are being used for drilling activities which are about 80-120 km offshore. Satellite communication is also being utilized along with microwave links to allow communications between shorebases.

Only communications systems in North Sea operations differs from those in the study area and elsewhere. As noted earlier the required communications ranges for the North Sea and the environmental conditions prevailing are comparable to those relevant in the study area. Early in 1965 when oil exploration in the North Sea got underway, the new communications demands for the British Sector were met by expanding the number of channels in the 2-4 MHz band available from coast radio stations. This augmented service by the British Post office to the rigs provides five speech channels, which can be used on a shared basis, and includes aproximately 90 dedicated teleprinter channels which can be equipped with error correcting devices and routed to specific inland business addresses (Hill, 1980; Hyatt, 1980).

The above rig service for the exploration activity is still in operation today, even though, in the later exploration stages spectrum congestion and channel interference became a major problem. Thus, for maximum frequency spectrum economy, an independent side band system (instead of a double side band emission) was soon adopted with the lower side band carrying one telephone channel shared between the rigs using the system and the uppere sideband carrying a multi-channel system having a capacity of up to 15 teleprinter channels. It was also soon realized that offshore production platforms would require a more

permanent communications network, submarine cables were considered but rejected for reasons of high cost and their possible vulnerability near offshore platforms. It was thought that satellite communications would not be available in time so trans-horizon radio using tropospheric scatter (tropo-scatter), with multichannel capacity was chosen by the British office.

A tropo-scatter system, as the name suggests, utilizes scattering properties of the troposphere to propagate weak but reliable signals several hundred miles beyond the horizon in the VHF, UHF, and SHF bands. The British trans-horizon radio links operate in either the 2.5 or 2 GHz bands and are configured on a quadruple diversity basis using space and polarization and a triangulated system to achieve four independent radio signal paths. Thus, four antennas (with a switching capacity) are used at the shore-base, each 12 to 18 m in diameter. Two of the antennas are connected to one platform and the other two antennas to the second platform through troposcatter links. The two offshore platforms are connected through a line of sight microwave link. Transmitter rated at at 1 kw output power are used. Typical antenna diameters on offshore terminals is from 6 to 8 m.

An important parameter in tropo-scatter propagation is the scatter angle or angle of intersection of the transmitting and receiving antenna beams. As narrow beam directional antennas are used in tropo-scatter systems, the orientation of the antennas on the drilling unit would have to automatically controlled or stabilized to provide communications when the drilling unit is under tow or during rough sea conditions. This antenna stabilization requirement is similar to that needed for communicating with the ANIK satellite. Even if possible, such a complex antenna installation on the drilling units and on the shorestation would be expensive. Thus, the tropo-scatter communications system is not a practical and economically viable option for offshore exploration communications in the study area unless fixed offshore platforms are used and there is a substantial density of exploration activity.

6.2 Systems Under Development

Among the other possible systems is the system known as meteor-burst propagation system. Frequencies in the VHF and UHF bands may be propagated by reflection from columns of ionization produced by meters entering the lower E region. Experimental single channel 2-way telegraph circuits have been operated over distances of 800 to 2000 km using frequencies in the range from 30 to 40 MHz and with transmitter powers of 1 to 3 kw. One-way transmission of voice and facsimile have also been conducted using transmitter powers of 1 and 20 kw, respectively. The frequency range from about 50 to 80 MHz appears to be best suited for meteor-burst transmission. The exact reliability of this type of transmission is not known but is unlikely to be better than HF sky-wave propagation.

Two relevant systems developed or under consideration by the Department of Communications (DOC) are the RACE System (Radio Telephone with Automatic Channel Evaluation) and the M-SAT (Mobile Satellite). RACE is a HF Radio Telephone system designed by DOC, and being manufactured by Canadian Marconi, which is intended to extend the coverage of the switched telephone system to remote communities, mining camps, drilling rigs, and ships on the high seas. The system is as easy to use and operates in the same manner as a conventional telephone. In field trials carried out during 1980 and 1981, a call success rate of over 98 percent has been demonstrated. The reliability is achieved through the use of a microprocessor which controls the radio and automatically selects the optimal frequency channel to establish communications. However, RACE does not appear to be capable of providing high quality voice or data circuits; significantly lesser quality is achieved in comparison with satellite or even VHF communication (Tarrant, 1983).

The Communications Research Centre of the DOC has also recently developed a low cost; HF message terminal which could substantially improve intership and ship-to-shore communications. This new terminal is designed to augment the capability of existing HF radios by allowing the transmissions of text messages over vast distances when

radio propagation conditions are too adverse to permit intelligible voice transmissions. The terminal has been successfully field tested and is expected to commercially available soon. The Canadian Department of Communications has plans to introduce a new satellite system, called Mobile Satellite (MSAT), which would provide mobile communications to the non-urban centres of Canada. This service will provide a high quality mobile service up to 200-250 miles offshore on the east coast (coverage dependent on satellite antenna foot-print) allowing both intership and shipshore communications. MSAT is expected to operate in the 800 MHz band and is being designed to provide mobile telephone, radio, paging, and data services at a reasonably low cost using portable satellite terminals which have very small antennas (less than 1 m). The feasibility and design study is anticipated to last until 1986 with a demonstration satellite expected to be in service from 1986 to 1994. The commercial service is being planned after 1994.

REFERENCES

Campbell, U.I. and L.E. Petrie, 1974, Radio Communications used for Offshore Oil Explorations in a Canadian Maritime Region, East Coast Petroleum Operators Association (EPOA) Project No. 9, Communications Research Centre (CRC) Report No. 1254, Department of Communications, Ottawa.

CCG (Canadian Coast Guard), NR (Newfoundland Region), 1981, The Canadian Coast Guard Radio Station, Telecommunications and Electronics Branch, Canadian Coast Guard, St. John's, Newfoundland.

CCIR (International Radio Consultative Committee), World Distributions of Atmospheric Noise, Report 322.

CCIR, Man Made Noise, Report 258-4.

DOC (Department of Communications), 1971, Coast and Ship Station Simple Sideband Radio Telephone Transmitters and Receivers operating in teh 1,605 - 28,000 KHz Band, Radio Stations Specifications (RSS) - 181, Issue 1, Telecommunications Regulation Branch.

DOC (Department of Communications), 1973, Data Required with Licence Applications for Radio System operating in the band bewteen 30 MHz and 1700 MHz, Radio Standards Procedure (RSP) - 101, Issue 3, Telecommunications Regulation Branch.

DOC (Department of Communications), 1977, Implementation in Canada of Single Side Band Techniques in the Maritime Mobile Service, Telecommunications Regulation Circular (TRC)-11, Telecommunication Regulating Service, Operations Branch.

DOC (Department of Communications), 1980, Table of Transmitting Frequencies in the Band 156-174 MHz for stations in the Maritime Mobile Service, Telecommunications Regulatory Circular (TRC)-13, Telecommunications Regulations Service, Operations Branch.

EPOA/APOA, 1983, Offshore Safety Task Force Report.

Haagensen, B., 1981, Advanced-Capability High Frequency Communications Systems, Presented at the International Radio Communications Conference, Denver, Colorado, June.

Hill, D.A. and J.R. Wait, 1981, HF Radio Wave Transmission Over Sea Ice and Remote Sensing Possibilities, IEEE Trans Geoscience and Remote Sensing, Vol. GE-19, No. 4, pp. 204-209

Hill, D.A. and J.R. Wait, 1981, HF Radio Wave Transmission Over Sea Ice and Remote Sensing Possiblilties, IEEE Trans Geoscience adn Remote Sensing, Vol. GE-19, N.Y. pp. 210-215

Hill, S.J., 1980, British Post Office Trans-Horizon Radio Links Serving offshore oil/gas Production Platforms, Radio and Electronic Engineer, Vol. 50, No. 8, pp. 397-406

Hyatt, J.L., 1980, Ship-Shore Communications for the Offshore Oil Industry, Radio and Electronic Engineer, Vol. 50, No. 8, pp. 381-389, August

ITU (International Telecommunications Union), 1959-1965, Radio Regualtions, Secretary General, General Switzerland

Meserve, J.M., 1974, U.S. Navy Marine Climatic Atlas of the World, Vol. 1, U.S. Headquarters. Washington.

NORDCO Limited, 1984, Summaries of Meteorological Observations for the Grand Banks, Unpublished.

OST (Offshore Services Technology), 1981, Status Report on UK00A's Offshore Communications Study, Vol. 14, No. 8, pp. 24, 26.

RCORMD (Royal Commission on the "Ocean Ranger" Marine Disaster) Hearings, 1982, Testimony of Mr. Wilcox.

Reference Data for Radio Engineers, 1972, Fifth Edition, International Telephone and Telegraph Corporation; New York.

SOLAS (Safety of Life at Sea) International Convention, 1974.

Swail, V.R. and L.D. Mortsch, 1983, Review of Activity Relating to Climatology of the Marine Atmospher on the East Coast of Canada, AES, Environment Canada, Report for the Royal Commission on the "Ocean Ranger" Marine Disaster.

Tarrant, D.R. (Newfoundland Telephone Co. Ltd.) 1983, Communications for the Offshore Oil Industry, Presented at the Safety Management for Offshore Operations on the Canadian East Coast Conference, Calgary, Alberta, June.

Transport Canada, 1981, Instructions to Inspectors of Compulsary Fitted Ship Station Radio Installations, IP-1896, Canadian Coast Guard, Telecommunications and Electronics Branch.

USDI (U.S. Dept. of Interior), 1977, Climatic Atlas of the Outer Continental Shelf Waters and Coastal Regions of Alaska, Vol. III.

APPENDIX A

TERMS OF REFERENCE

APPENDIX "A"
STATEMENT OF WORK

INTRODUCTION

The Royal Commission on the Ocean Ranger Marine Disaster has been given comprehensive Terms of Reference which are divided into two parts.

Part One calls for an extensive investigation into the loss of the drill rig, Ocean Ranger. This inquiry has been underway since the Commission was jointly established in March 1982 by the governments of Canada and Newfoundland and Labrador.

Part Two of the Commission's Terms of Reference call for it to "inquire into, report upon, and make recommendations with respect to" both the marine and drilling aspects of practices and procedures in respect of Eastern Canadian Offshore drilling operations and to a number of specific matters relating to drilling units operating offshore.

To address the Part Two Terms of Reference, the Commission is undertaking a study program the goal of which is to identify practical means of improving the safety of Eastern Canada Offshore drilling operations.

The study area is Eastern Canadian Offshore extending from the shoreline to the limits of jurisdictional claims. The area extends from the Canada-US boundary north to the limit of areas which will be serviced from East Coast ports and use marine drilling systems (approximately 75°N).

The subject of study is offshore exploration and delineation drilling operations, including service and supply (marine and air) activities

The issue is human safety. Property safety will be considered to the extent it affects human safety. Environmental safety will be addressed by a State of the Art Review.

The Part Two Study Plan will include the following areas:

1. Environment

This study area will address the physical environment conditions within which offshore drilling operations take place. Emphasis will be placed on severe and limiting conditions and their detection or prediction.

2. Regulation

This study area will address the manner in which offshore drilling operations are controlled by rules, regulations, and guidelines and their relationship to safety. Emphasis will be on government control, but included will be industry control.

3. Design

This study area addresses the process of conception, design, construction, classification, and certification of structures and equipment used in offshore drilling operations. It will include consideration of operational limitations and upkeep requirements.

4. Safety

This study area focuses on elements of offshore drilling operations directly related to establishment and maintenance of personnel safety. It includes the identification of levels of risk for various activities. It deals with workplace health and safety. In particular it will address systems to ensure survival and

minimize injury resulting from unplanned events. Special focus will be given to systems of evacuation, survival and recovery, including self help as well as external assistance.

5. Training

To evaluate and, as appropriate, recommend improvements to operational marine and safety training for the Eastern Canadian offshore petroleum industry and related sectors.

STUDY OBJECTIVE

To assess critically the means for communication in relation to safe operation of Eastern Canada offshore exploratory drilling and to provide a perspective on practical possibilities to improve these means should they be found to be deficient.

Definitions

Drilling System - refers to a drilling unit and the support facilities such as support vessels, transport helicopters, and shore bases assigned to that particular drilling unit.

Means of Communication - refers to the communications hardware used to transmit information from place to place by verbal, written, or other means.

SCOPE

This study will examine the communications systems currently in use for Eastern Canada offshore drilling units, support vessels, transport helicopters, and at shore support bases. Both internal and external communications systems will be examined; and an assessment will be made of their adequacy to ensure safe operations in terms of information transmittal capability, reliability, ease of use, physical location of the equipment, compatability of the systems, and special training required for use.

An evaluation will be made of the reliability of communications systems to ensure their proper operation during an emergency event, including a condition involving a partial or total failure of a communication system. The conditions which could lead to the failure of the individual communications systems will be examined and documented.

The study will examine communications systems in use in the offshore drilling industry and in other offshore industries in other areas of the world as well as systems which are being developed to determine their applicability and effectiveness in the Eastern Canada offshore.

TASK DESCRIPTION

The contractor will undertake a review of the communications systems currently in use in Eastern Canada offshore exploratory drilling.

The internal communications system of drilling units presently in use and the external communications systems of drilling units, support vessels, transport helicopters and shore bases will be examined; and a description of these communications systems will be provided.

The described communications systems will be evaluated, and an assessment will be made of their individual suitability in terms of:

1. the required quality and quantity of transmissions
2. reliability

3. ease of use
4. physical location of the equipment
5. compatability with other systems
6. training required to operate.

The total communications network associated with each "drilling system" (drilling unit, support vessels, transport helicopters, shore bases) will be examined; and an assessment will be made as to the effectiveness of the system in maintaining communications links between each component. The degree of redundancy inherent in the communications system will be identified; and an assessment will be made as to the conditions which could occur which would lead to a loss of communications between various components (ie. drilling unit and support vessel, shore base and support vessel, shore base and drilling unit, etc.).

Communications systems currently in use in the offshore drilling industry and in other offshore industries in other areas of the world will also be examined and evaluated using the same criteria as was used in the evaluation of systems currently in use in the Eastern Canada offshore. Systems currently being developed will also be examined and evaluated using these criteria.

An assessment will be made on the combination of the individual systems currently in use or under development which would provide the most "desirable" overall communications system for a "drilling system" in terms of information transmission, reliability, ease of use, physical location of equipment, compatability with other systems, and required training.

SCHEDULE

From the date of contract award, the report will be submitted in 12 weeks.

REPORT REQUIREMENTS

Ten copies of the draft final report will be provided. A single camera-ready copy of the final report will be provided.

The report format, type size, and spacing will adhere to Commission guidelines for appendix documents.

RELEASE OF REPORT

It is a policy of the Commission that reports submitted to it will be released to the public. These reports will be identified as exercises funded by the Commission but not necessarily representing the Commission's viewpoint. The timing of the release of these reports will be at the discretion of the Commission.

APPENDIX B
CANADIAN SHIPPING ACT REGULATIONS

SHIP STATION RADIO REGULATIONS,
SHIP STATION TECHNICAL REGULATIONS,
AND
VHF RADIOTELEPHONE PRACTICES AND PROCEDURES REGULATIONS
UNDER
THE CANADA SHIPPING ACT
AND
THE ARCTIC WATERS POLLUTION PREVENTION ACT

CANADA SHIPPING ACT

VHF Radiotelephone Practices and Procedures Regulations

REGULATIONS PRESCRIBING PRACTICES AND PROCEDURES TO BE FOLLOWED BY PERSONS ON BOARD SHIPS IN RESPECT OF BRIDGE-TO-BRIDGE VHF RADIOTELEPHONES TO ENSURE SAFE NAVIGATION

Short Title

1. These Regulations may be cited as the VHF [illegible].

Interpretation

2. In these Regulations,

''appropriate'' means, with respect to a VHF frequency, that the frequency is specified in notices to mariners or in any law of Canada or of any country other than Canada for use in a traffic zone or part thereof for vessel traffic management purposes; (approprié)

''complement'' means the number of persons comprising the master and crew of a ship; (effectif)

''deck watch'' means that part of the complement that is required for the purpose of attending to the navigation or security of a ship; (quart à la passerelle)

''master'' includes every person having command or charge of any ship, but does not include a pilot; (capitaine)

''person in charge of the deck watch'' includes every person who has immediate charge of the navigation or security of a ship, but does not include a pilot; (responsable du quart à la passerelle)

''Prince Rupert Traffic Zone'' means the Canadian waters north of Vancouver Island between a line drawn from Triangle Island to Cape Caution and the boundary line between British Columbia and the State of Alaska; (zone de trafic de Prince-Rupert)

''qualified in the use of the radiotelephone'' means that a person is capable of making effective use of the radiotelephone for communications in accordance with international procedures; (qualifié en radiotéléphonie)

''restricted in its ability to manoeuvre'', in respect of a ship, means that from the nature of its work the ship is restricted in its ability to manoeuvre as required by the Collision Regulations and is therefore unable to keep out of the way of another ship; (restreint dans sa capacité de manoeuvrer)

''routing system'' has the meaning assigned by the Collision Regulations; (système d'organisation du trafic)

''ship'' includes every description of vessel used in [illegible]

''traffic centre'' means a centre established by a government for the purpose of regulating marine traffic within a traffic zone; (centre de gestion du trafic)

''traffic zone'' means an area within the VHF coverage of a traffic centre

(a) described in notices to mariners or in any law of Canada or of any country other than Canada;

(b) established for the purpose of regulating vessel traffic;

(c) in which vessels are to use a VHF frequency other than Channel 16 (156.8 MHz) for vessel traffic management purposes; and

(d) in respect of which a continuous listening watch on Channel 16 (156.8 MHz) is maintained for ships by that traffic centre or by a coast station that can establish effective communications with a traffic centre without delay;

(zone de gestion du trafic)

''underway'' means, in respect of a ship, that the ship is not at anchor, made fast to the shore or aground. (faisant route)

Application

3. (1) Subject to subsections (2) and (3), these Regulations apply to every ship that is required by the Ship Station Radio Regulations to be fitted with a bridge-to-bridge VHF radiotelephone installation when it is located,

(a) in the case of a ship other than a Canadian ship, within

(i) Canadian waters, or

(ii) any fishing zone of Canada prescribed pursuant to the Territorial Sea and Fishing Zones Act; and

(b) in the case of a Canadian ship, within any waters.

(2) In the event of any inconsistency between these [illegible] prevail to the extent of the inconsistency in respect of such a Canadian ship.

(3) These Regulations do not apply in the Prince Rupert Traffic Zone.

General

4. Where, at any time, a radio transmission required to be made by these Regulations is prohibited by any other law or may cause a fire or an explosion, the transmission shall be made as soon as it is permitted by that law or is not likely to cause a fire or an explosion.

5. (1) The master or a person authorized by him to maintain a listening watch or to make a navigation safety call required by these Regulations shall be qualified in the use of the radiotelephone.

(2) Where any person maintaining a listening watch or [illegible] is not in charge of the [illegible], he shall, [illegible] watch of

(a) any information he receives, and

(b) any navigation safety call he makes

that is likely to affect the safe navigation of the ship.

6. Nothing in these Regulations shall be construed as

(a) relieving a ship of its obligation to sound the appropriate whistle signals required by, or

(b) permitting a ship to carry out manoeuvres that contravene the provisions of the steering and sailing Rules of,

the Collision Regulations that apply in the area being navigated by the ship.

7. The master and the person in charge of the deck watch shall ensure that these Regulations are complied with.

Listening Watch

8. (1) Subject to subsection (3), on every ship a listening watch on a VHF radiotelephone receiver shall be maintained continuously during the period commencing fifteen minutes before the ship is underway and terminating when the ship is

(a) securely anchored, moored or made fast to the shore or secured by any means to the bottom; and

(b) in a place where its presence does not constitute a hazard to passing ships.

(2) The VHF radiotelephone receiver referred to in subsection (1) shall be set as follows:

(a) when the ship is within a traffic zone, to the VHF frequency appropriate to that zone or a part thereof, or

(b) when the ship is not within a traffic zone to Channel 16 (156.8 MHz)

and shall operate with sufficient gain to permit it to receive normal communications on that frequency or channel if other radio transmissions do not block out such communications by capture or override.

(3) Where any ship is not fitted with an additional or built-in facility that permits continuous or sequential monitoring of Channel 16 (156.8 MHz), the listening watch required by subsection (1) may be interrupted for short periods while the radiotelephone installation is being used to transmit or receive communications on another frequency authorized in the licence for that installation.

Navigation Safety Call

9. (1) Subject to subsection (3), every ship, other than a dredge or floating plant, that is maintaining a listening watch pursuant to section 8 shall make a navigation safety call on the frequency on which it is maintaining the listening watch

(a) when risk of collision with another ship is deemed to exist under those provisions of the Collision Regulations that apply in a traffic separation scheme established by the Minister;

(b) when the navigation safety call of another ship indicates that a close quarters situation may develop;

(c) when the ship is in a narrow channel or fairway and is about to

(i) overtake another ship,

(ii) be overtaken by another ship and agrees or objects to being overtaken;

(d) when doubt exists as to the actions or the intentions of another ship;

(e) when the ship is nearing a bend in a river, channel or fairway or an obstruction around which an approaching ship cannot adequately be seen;

(f) when the ship is approaching, in restricted visibility,

(i) a charted route, including a ferry route, or

(ii) a concentration of vessels;

(g) before the ship commences a manoeuvre that will impede the safe navigation of other ships;

(h) when a ship is engaged in fishing with nets, lines, trawls, trolling lines or other apparatus, or restricted in its ability to manoeuvre in or near a routing system and is being approached by another ship, other than a ship engaged in fishing;

(i) when the ship is approaching a dredge or floating plant in or near a river, channel or fairway;

(j) fifteen minutes before and again immediately before the ship departs from any berth, anchorage, mooring area, booming ground, dredge or floating plant; and

(k) at any other time when a navigation safety call may contribute to the safe navigation of the ship or any other ship.

(2) A navigation safety call referred to in subsection (1) shall

(a) contain only information that is essential for safe navigation and not delay the ship unduly;

(b) so far as is practicable, indicate, in the following sequence,

(i) the identity of the ship,

(ii) the location of the ship, and

(iii) the intended course of action; and

(c) be followed, if necessary, in the following sequence, by indications as to

(i) the present course and speed of the ship, and

(ii) whether the ship is

(A) towing or pushing,

(B) not under command,

(C) restricted in its ability to manoeuvre,

(D) engaged in fishing, other than trolling,

(E) severely restricted in its ability to deviate from the course it is following because of its draft in relation to the available depth of water,

(F) engaged in pilotage duty,

(G) at anchor, or

(H) aground.

(3) A navigation safety call referred to in subsection (1) is not required to be made by a ship

(a) that, while engaged in a towing operation, is manoeuvring in or around any berth, anchorage, mooring area, booming ground, dredge or floating plant if the ship

(i) manoeuvres in such a manner that it will not impede the safe navigation of other vessels, and

(ii) makes a navigation safety call fifteen minutes [illegible] berth, anchorage, mooring area, booming ground, dredge or floating plant, or

(b) that is reporting to a traffic centre

unless any of the circumstances described in paragraphs (1)(a) to (h) or (k) occurs.

Dredges and Floating Plants

10. (1) Subject to subsection (3), every dredge or floating plant that is maintaining a listening watch pursuant to section 3 shall make a navigation safety call on the frequency on which it is maintaining the listening watch

(a) when approached by another ship not engaged in an operation related to the dredge or floating plant;

(b) when requested to do so by another ship; and

(c) at any other time when a navigation safety call may contribute to the safety of the dredge or floating plant or the safe navigation of any other ship.

(2) A navigation safety call referred to in subsection (1) shall

(a) contain only information that is essential for safe navigation and not exceed one minute in duration; and

(b) so far as is practicable, indicate in the following sequence

(i) the identity and location of the dredge or floating plant, and

(ii) whether or not any part of the river, channel or fairway is obstructed and, if so, the side on which

(A) the obstruction exists, and

(B) another ship may pass.

(3) A navigation safety call is not required to be made by a dredge or floating plant under the circumstances described in paragraph (1)(a) if the dredge or floating plant is reporting to a traffic centre unless any of the circumstances described in paragraph (1)(b) or (c) occurs.

This regulation establishes VHF radiotelephone bridge-to-bridge practices and procedures to ensure safe and efficient navigation.

SOR/DORS 78-219

NOTE

The Consolidated Regulations of Canada, 1978 (C.R.C.) have been published and came into force on August 15, 1979. They include regulations, as defined in the Statute Revision Act, that were in force and of general application as of December 31, 1977. The nineteen volumes comprising the Consolidation may be obtained from the Canadian Government Publishing Centre, Supply and Services Canada, Hull, Quebec, K1A 0S9 upon payment of the price of $350.00.

Regulations and other instruments published in Part II of the *Canada Gazette* during 1978 that amended or revoked instruments contained in the Consolidated Regulations have been re-published for the convenience of readers in a Special Issue of Part II of the *Canada Gazette*. This will enhance the comprehensibility of the 1978 instruments by referring to the text of the prior instruments as it now appears in the Consolidated Regulations. The two volumes of the Special Issue may be obtained from the Canadian Government Publishing Centre upon payment of the price of $69.00.

Each amending regulation and other instrument appearing in the first sixteen issues of Part II of the *Canada Gazette* in 1979 was footnoted by title and section number or subdivision thereof to indicate its relation to the C.R.C., where applicable.

Commencing with the seventeenth issue, any material published in Part II of the *Canada Gazette* and affecting the C.R.C. will refer in the body of the text to a chapter number and, if re-numbering has taken place, to new section numbers. In addition, each amendment or revocation of a regulation or other instrument will be footnoted to cite previous relevant amendments of each section or subdivision thereof that is being amended or revoked.

REMARQUE

La Codification des règlements du Canada, 1978 (C.R.C.) a été publiée et est entrée en vigueur le 15 août 1979. Elle comprend tous les règlements d'application générale qui, conformément à la Loi sur la révision des lois, étaient en vigueur le 31 décembre 1977. Les intéressés peuvent se procurer, pour $350, un exemplaire des dix-neuf volumes de cette publication en écrivant au Centre d'édition du gouvernement du Canada, Approvisionnements et Services Canada, Hull (Québec) K1A 0S9.

Les règlements et autres textes réglementaires publiés dans la Partie II de la *Gazette du Canada* pendant l'année 1978 qui modifient ou abrogent des textes contenus dans la Codification des règlements ont été republiés, pour la commodité des lecteurs, dans un numéro spécial de la Partie II de la *Gazette du Canada*. La compréhension des textes réglementaires de 1978 en sera facilitée puisque l'on s'y reporte au libellé des textes antérieurs comme c'est le cas dans la Codification des règlements. Les intéressés peuvent se procurer les deux volumes de ce numéro spécial au Centre d'édition du gouvernement du Canada, pour la somme de $69.

Toutes les modifications aux règlements et autres textes réglementaires publiées dans les seize premiers numéros de la Partie II de la *Gazette du Canada* de 1979 étaient accompagnées de notes donnant le titre et le numéro de l'article ou du paragraphe visé et indiquant de quelle façon est touchée la Codification lorsqu'il y a lieu.

A compter du 17e numéro, tout document publié dans la Partie II de la *Gazette du Canada* qui modifie la Codification indiquera, dans le corps du texte, le numéro du chapitre visé et, s'il y a eu renumérotage, les nouveaux numéros des articles. De plus, des notes explicative citant les modifications pertinentes de chaque article ou paragraphe modifié ou abrogé accompagneront chacune des modifications ou abrogations de règlements ou autres textes réglementaires.

"MF coverage area" means all waters, except the waters of the VHF coverage area, that are within 150 miles

(a) of the Pacific coast between the Latitudes of 46° and 55° north Latitude including the inner passages of the Alaskan Panhandle, and

(b) of the Atlantic coast between the Latitudes of 40° and 65° north Latitude

and that are defined in the publication "Radio Aids to Marine Navigation" published by the Canadian Coast Guard, Department of Transport; (*zones MF*)

"mile" means the international nautical mile of 1,852 metres, (*mille*)

"minor waters voyage, class II" has the meaning assigned to that expression by section 6 of the *Home-Trade, Inland and Minor Waters Voyages Regulations*; (*voyages en eaux secondaires, classe II*)

"radiotelegraph installation" and "radiotelephone installation" means an installation that complies with the applicable requirements of the *Ship Station Technical Regulations*; (*installation radiotélégraphique* or *radiotéléphonique*)

"shipping safety control zone" has the same meaning as in the *Arctic Waters Pollution Prevention Act*; (*zones de contrôle*)

"tons" means gross tons; (*tonneaux*)

"towing ship" means a ship engaged in towing another ship or a floating object astern or alongside or in pushing another ship or a floating object ahead;

"Type A ship" has the same meaning as in the *Arctic Shipping Pollution Prevention Regulations*; (*navires de type A*)

"VHF coverage area" means

(a) the Great Lakes,

(b) the Saguenay River downstream from Chicoutimi,

(c) the St. Lawrence River as far seaward as a straight line drawn

(i) from Cap des Rosiers to West Point Anticosti Island, and

(ii) from Anticosti Island to the north shore of the St. Lawrence River along the meridian of longitude 63° west,

(d) Puget Sound, State of Washington, U.S.A., and

(e) all waters that are within a coverage radius of a Canadian Coast Guard radio station providing a continuous maritime mobile distress and safety service on 156.8 MHz and that are defined in the publication "Radio Aids to Marine Navigation" published by the Canadian Coast Guard, Department of Transport.

(*zones VHF*)

Application

3 (1) Subject to subsections (3) and (4), these Regulations apply to

(a) every Canadian ship carrying pollutants and every non-Canadian ship carrying pollutants and engaged in the coasting trade of Canada that is

(i) in Canadian waters south of the sixtieth parallel of north latitude,

«voyages de cabotage, classe IV», ceux visés à l'article 4 du *Règlement sur les voyages de cabotage, en eaux intérieures et en eaux secondaires*, (*home-trade voyage, class IV*)

«voyages en eaux secondaires, classe II», ceux visés à l'article 6 du *Règlement sur les voyages de cabotage, en eaux intérieures et en eaux secondaires*, (*minor waters voyage, class II*)

«zones de contrôle», les zones de contrôle de la sécurité de la navigation visées à la *Loi sur la prévention de la pollution des eaux arctiques*, (*shipping safety control zone*)

«zones HF», les eaux, sauf celles des zones VHF et MF, se trouvant au nord du 20° de latitude nord et à l'intérieur de 600 milles du continent nord-américain, (*HF coverage area*)

«zones MF», toutes les eaux, sauf celles de la zone VHF se trouvant à l'intérieur de 150 milles

a) de la côte du Pacifique comprises entre le 46° et le 55° de latitude nord, y compris les passages intérieurs de la partie méridionale de l'Alaska et

b) de la côte Atlantique comprises entre le 40° et le 65° de latitude nord

et qui sont définies dans la publication «Aides radio à la navigation maritime» publiée par la Garde côtière canadienne, ministère des Transports, (*MF coverage area*)

«zones VHF», s'applique

a) aux Grands lacs,

b) à la rivière Saguenay en aval de Chicoutimi,

c) au fleuve Saint-Laurent aussi loin en direction de la mer qu'une ligne droite tracée

(i) du cap des Rosiers à la pointe ouest de l'île d'Anticosti et

(ii) de l'île d'Anticosti à la rive nord du fleuve Saint-Laurent, le long du méridien de longitude 63° ouest,

d) au Puget Sound, État de Washington, É.-U. et

e) aux eaux situées dans un rayon de couverture d'une station radio de la Garde côtière canadienne assurant un service mobile maritime de détresse et de sécurité continu sur 156,8 MHz et qui sont définies dans la publication «Aides radio à la navigation maritime» publiée par la Garde côtière canadienne, ministère des Transports.

(*VHF coverage area*)

Application

3. (1) Sous réserve des paragraphes (3) et (4), le règlement s'applique

a) aux navires canadiens transportant des polluants et aux navires étrangers transportant des polluants et affectés au cabotage en eaux canadiennes, se trouvant

(i) dans les eaux canadiennes au sud du soixantième parallèle de latitude nord,

(ii) in Canadian waters north of the sixtieth parallel of north latitude that are not within a shipping safety control zone,

(iii) in a fishing zone of Canada prescribed pursuant to the *Territorial Sea and Fishing Zones Act*, or

(iv) navigating in a shipping safety control zone; and

(*b*) every Canadian ship that is navigating in any waters other than those described in subparagraphs (*a*)(i) to (iv).

(2) Subject to subsections (3) and (4), paragraph 4(1)(*a*), subsection 4(6) and section 5 apply to every non-Canadian ship carrying pollutants that is in the waters described in subparagraphs (1)(*a*)(i) to (iii) or navigating in a shipping safety control zone.

(3) Section 4 does not apply to

(*a*) a ship other than a towing ship that is under 300 tons, unless it is 20 metres or more in length, certified to carry more than 12 passengers for hire and engaged on a voyage other than a home trade voyage, class IV or a minor waters voyage, class II; or

(*b*) a towing ship that is

(i) under 300 tons unless

(A) its tow is a ship of 300 tons or more, or one or more floating objects having an aggregate dimension in any direction of 45 metres or more, or

(B) it is 20 metres or more in length, certified to carry more than 12 passengers for hire and engaged on a voyage other than a home-trade voyage, class IV or a minor waters voyage, class II, or

(ii) of any tonnage where

(A) its tow is a ship that complies with that section,

(B) one or more other towing ships are engaged in the same towing operation and the ship would comply with that section if it were fitted with all the radio installations fitted on those other towing ships, or

(C) the towing operation is undertaken in an emergency and it is not possible for the towing ship to comply with that section.

(4) Sections 4 and 5 do not apply to a ship that is

(*a*) making a minor waters voyage in waters other than those listed in the schedule;

(*b*) a non self-propelled dredge or similar floating plant that is not located in or near a channel or fairway or in any other place where it constitutes a hazard to passing ships; or

(*c*) a towing ship where the towing ship and its tow are located within a booming ground.

Radiotelephone Installations

4. (1) Subject to subsections (2) to (5), a ship

(*a*) within the VHF coverage area of the Great Lakes and the St. Lawrence River above St. Lambert Lock shall be fitted with at least two bridge-to-bridge VHF radiotelephone installations;

(ii) dans les eaux canadiennes au nord du soixantième parallèle de latitude nord non comprises dans les zones de contrôle,

(iii) dans les zones de pêche du Canada prescrites selon la *Loi sur la mer territoriale et les zones de pêche* ou

(iv) naviguant dans les zones de contrôle et

b) aux navires canadiens naviguant dans des eaux autres que celles visées aux sous-alinéas *a*)(i) à (iv).

(2) Sous réserve des paragraphes (3) et (4), l'alinéa (4)(1)*a*), le paragraphe 4(6) et l'article 5 s'appliquent aux navires étrangers transportant des polluants et se trouvant dans les eaux décrites aux sous-alinéas (1)*a*)(i) à (iii) ou naviguant dans des zones de contrôle.

(3) L'article 4 ne s'applique pas

a) à un navire autre qu'un remorqueur de moins de 300 tonneaux, à moins qu'il n'ait 20 m ou plus de longueur, qu'il ne soit homologué pour transporter plus de 12 passagers payants et qu'il n'effectue un voyage autre qu'un voyage de cabotage, classe IV ou en eaux secondaires, classe II ou

b) un remorqueur

(i) de moins de 300 tonneaux, à moins

(A) qu'il ne remorque un navire de 300 tonneaux ou plus, ou un ou plusieurs objets flottants ayant des dimensions globales en toute direction de 45 m ou plus, ou

(B) qu'il n'ait 20 m ou plus de longueur, qu'il ne soit homologué pour transporter plus de 12 passagers payants et qu'il n'effectue un voyage autre qu'un voyage de cabotage, classe IV ou en eaux secondaires, classe II ou

(ii) de toute jauge lorsque

(A) sa remorque est un navire qui se conforme à cet article,

(B) un ou plusieurs autres remorqueurs participent au même remorquage, le navire devant se conformer à cet article s'il est muni de toutes les installations radio dont sont pourvus les autres remorqueurs ou

(C) l'activité de remorquage est entreprise lors d'une situation d'urgence et qu'il est impossible au remorqueur de se conformer à cet article.

(4) Les articles 4 et 5 ne s'appliquent pas

a) à un navire effectuant un voyage en eaux secondaires dans des eaux autres que celles visées à l'annexe,

b) à un chaland non autopropulsé ou à une usine flottante semblable qui ne sont pas situés dans un chenal ou une voie navigable ou près de ces derniers ou à tout autre endroit où ils présentent un risque pour les navires qui passent ou

c) à un remorqueur, lorsque sa remorque et lui-même sont situés à l'intérieur d'une aire de flottage.

Installations radiotéléphoniques

4. (1) Les navires situés

a) à l'intérieur de la zone VHF des Grands lacs et du Saint-Laurent en amont de l'écluse de Saint-Lambert doivent être équipés d'au moins deux installations radiotéléphoniques VHF entre passerelles,

(*b*) within any VHF coverage area other than the area described in paragraph (*a*) shall be fitted with at least

(i) two bridge-to-bridge VHF radiotelephone installations, or

(ii) one bridge-to-bridge VHF radiotelephone installation and one MF radiotelephone installation;

(*c*) within the MF coverage area shall be fitted with at least one bridge-to-bridge VHF radiotelephone installation and one MF radiotelephone installation; and

(*d*) outside the VHF and MF coverage areas shall be fitted with at least one bridge-to-bridge VHF radiotelephone installation, one MF radiotelephone installation and one combined MF/HF radiotelephone installation.

(2) Where a ship described in subsection 6(2) is within a VHF coverage area, it shall be fitted with at least two bridge-to-bridge VHF radiotelephone installations.

(3) A ship outside the VHF and MF coverage areas need not be fitted with a combined MF/HF radiotelephone installation required by paragraph (1)(*d*) if that ship is fitted with an MF radiotelegraph installation that complies with the Safety Convention.

(4) A non-Canadian ship within shipping safety control zone 14, 15 or 16 need not be fitted with a MF radiotelephone installation required by paragraph (1)(*c*) if that ship is fitted with an MF radiotelegraph installation that complies with the Safety Convention.

(5) A ship within the VHF coverage area described in paragraph (1)(*a*) need not be fitted with more than one VHF radiotelephone installation until January 1, 1978.

(6) Where a ship of 20 metres or more in length is fitted with only one bridge-to-bridge VHF radiotelephone installation the ship shall, at the conning position, be fitted with

(*a*) an additional radio facility that provides continuous or sequential monitoring of channel 16 (156.8 MHz) which facility may be additional to or built into the bridge-to-bridge VHF radiotelephone installation; or

(*b*) an additional radio facility capable of receiving on a marine band, navigational warnings for the area in which the ship is navigating.

(7) A Type A or Arctic Class ship within any waters that are north of the sixty-fifth parallel of north Latitude and in a shipping safety control zone shall be fitted with telecommunication equipment that is capable of receiving fixed images transmitted from a Canadian radio station and an ice reconnaissance aircraft of the frequencies appropriate to the area of operation and of reproducing those images in a permanent form.

5. Every ship referred to in subsection 3(3) as a ship to which section 4 does not apply and that is

(*a*) 20 metres or more in length,

(*b*) a passenger ship certified to carry 6 or more passengers for hire, or

(*c*) a towing ship,

shall be fitted with at least one bridge-to-bridge VHF radiotelephone installation.

b) à l'intérieur de toute zone VHF autre que celle décrite à l'alinéa *a*) doivent être équipés au moins

(i) deux installations radiotéléphoniques VHF entre passerelles ou

(ii) d'une installation radiotéléphonique VHF entre passerelles et d'une installation radiotéléphonique MF,

c) à l'intérieur d'une zone MF doivent être équipés au moins d'une installation radiotéléphonique VHF entre passerelles et d'une installation radiotéléphonique MF et

d) à l'extérieur des zones VHF et MF doivent être équipés au moins d'une installation radiotéléphonique VHF entre passerelles d'une installation radiotéléphonique MF et d'une installation radiotéléphonique combinée MF/HF.

(2) Les navires visés au paragraphe 6(2) et situés à l'intérieur d'une zone VHF doivent être équipés d'au moins deux installations radiotéléphoniques VHF entre passerelles.

(3) Les navires situés à l'extérieur des zones VHF et MF ne sont pas tenus d'être équipés d'une installation radiotéléphonique combinée MF/HF exigée à l'alinéa 1*d*) s'ils sont équipés d'une installation radiotélégraphique MF conformément à la Convention sur la sécurité.

(4) Les navires étrangers situés à l'intérieur des zones de contrôle 14, 15 ou 16 ne sont pas tenus d'être équipés d'une installation radiotéléphonique MF exigée à l'alinéa (1)*c*) s'ils sont équipés d'une installation radiotélégraphique MF selon la Convention sur la sécurité.

(5) Les navires situés à l'intérieur de la zone VHF décrite à l'alinéa (1)*a*) ne sont pas tenus d'être équipés de plus d'une installation radiotéléphonique VHF avant le 1er janvier 1978.

(6) Les navires de 20 m ou plus de longueur équipés d'une seule installation radiotéléphonique VHF entre passerelles doivent être équipés à la timonerie

a) d'une installation radio additionnelle permettant d'assurer une écoute continue ou séquentielle de la voie 16 (156,8 MHz) et cette installation peut être ajoutée ou intégrée à l'installation radiotéléphonique VHF entre passerelles ou

b) d'une installation radio additionnelle pouvant recevoir sur une bande maritime des avertissements sur la navigation dans le secteur où se trouve le navire.

(7) Les navires de type A ou de côte arctique, situés dans les eaux au nord du soixante-cinquième parallèle de latitude nord et dans les zones de contrôle, doivent être équipés de matériel de télécommunication pouvant recevoir des images fixes transmises d'une station radio canadienne ou d'un aéronef de reconnaissance dans les glaces sur les fréquences appropriées au secteur d'opération et pouvant reproduire des images sous forme permanente.

5. Les navires mentionnés au paragraphe 3(3) comme n'étant pas visés par l'article 4,

a) mesurant 20 m ou plus de longueur,

b) étant des navires à passagers homologués pour transporter 6 passagers ou plus payants ou

c) étant des remorqueurs,

doivent être équipés d'au moins une installation radiotéléphonique VHF entre passerelles.

Radiotelegraph Installations

6. (1) A Canadian Safety Convention ship that is

(*a*) a passenger ship, or

(*b*) a cargo ship of 1,600 tons or more and engaged on a voyage beyond the limits of the HF coverage area

shall be fitted with at least one MF radiotelegraph installation that complies with the Safety Convention.

(2) A non-Safety Convention passenger ship certified to carry

(*a*) 50 or more persons and engaged on a voyage that is more than 200 miles from one place to another,

(*b*) 250 or more persons and engaged on a voyage that is more than 90 miles from one place to another, or

(*c*) 500 or more persons and engaged on a voyage that is more than 20 miles from one place to another

shall, when it is within the HF or MF coverage area be fitted with at least one MF radiotelegraph installation or, after January 1, 1980, one radiotelex installation capable of receiving transmissions from a Canadian Coast Guard radio station appropriate to the area of operation.

Arctic Navigation

7. No ship shall navigate within any shipping safety control zone unless it complies with the applicable provisions of these Regulations.

Equivalents

8. Where these Regulations require a particular radiotelephone installation or radiotelegraph installation to be fitted in a ship or a particular provision to be made in a ship, the Chairman may, on receipt of an application made to him by the owner of the ship or his authorized representative, permit any other radiotelephone installation or radiotelegraph installation to be fitted in the ship or any other provision to be made if he is satisfied that such other installation or provision is at least equivalent to that required by these Regulations.

Fines

9. Every person who contravenes the provisions of the *Ship Station Technical Regulations* is guilty of an offence and liable on summary conviction to a fine not exceeding fifty dollars and costs.

SCHEDULE

MINOR WATERS

Newfoundland

1. Humber Arm

Prince Edward Island

2. Charlottetown Harbour

3. Summerside Harbour

Installations radiotélégraphiques

6. (1) Un navire canadien ressortissant à la Convention sur la sécurité étant

a) un navire à passagers ou

b) un navire de cargaison de 1 600 tonneaux ou plus naviguant en dehors de la zone HF

doit être équipé d'au moins une installation radiotélégraphique MF, selon la Convention sur la sécurité.

(2) Un navire à passagers ne ressortissant pas à la Convention sur la sécurité et homologué pour transporter

a) 50 personnes ou plus et effectuant un voyage de plus de 200 milles d'un endroit à un autre,

b) 250 personnes ou plus et effectuant un voyage de plus de 90 milles d'un endroit à un autre ou

c) 500 personnes ou plus et effectuant un voyage de plus de 20 milles d'un endroit à un autre

doit, lorsqu'il est situé à l'intérieur des zones HF ou MF, être équipé d'au moins une installation radiotélégraphique MF ou, après le 1er janvier 1980, d'une installation radiotélex pouvant recevoir des transmissions d'une station radio de la Garde côtière canadienne appropriée au secteur d'activité.

Navigation dans l'Arctique

7. Nul navire ne peut naviguer à l'intérieur d'une zone de contrôle à moins de se conformer au règlement.

Équivalences

8. Le président du Bureau d'inspection des navires à vapeur peut, à la réception d'une demande du propriétaire du navire ou de son représentant autorisé, permettre que le navire soit équipé de toute autre installation radiotéléphonique ou radiotélégraphique ou que toute autre disposition soit prise s'il estime que cette installation ou que cette disposition est au moins équivalente à celle prescrite par ce règlement.

Amendes

9. Quiconque contrevient au *Règlement technique sur les stations (radio) de navires* est coupable d'une infraction et est passible, sur déclaration sommaire de culpabilité, d'une amende d'au plus cinquante dollars et des frais.

ANNEXE

EAUX SECONDAIRES

Terre-Neuve

1. Humber Arm

Île-du-Prince-Édouard

2. le port de Charlottetown

3. le port de Summerside

Nova Scotia

4. The Bras d'Or Lake
5. Halifax Harbour and the waters inside a line joining the triangulation station on Osborne Head to the eastern extremity of Chebucto Head

New Brunswick

6. Saint John Harbour
7. Miramichi Bay
8. Nepisiquit Bay
9. Dalhousie Harbour
10. Shippegan Sound

Quebec

11. St. Lawrence River

Ontario

12. St. Lawrence River
13. Detroit River
14. St. Clair River
15. St. Marys River

British Columbia

16. Alberni Inlet
17. Quatsino Sound
18. Jervis Inlet
19. Prince Rupert Harbour
20. Fraser River downstream from Pitt River
21. Skeena River downstream from Port Essington

Nouvelle-Écosse

4. le lac Bras d'Or
5. le port d'Halifax et les eaux délimitées par une ligne reliant la station de triangulation de Osborne Head à l'extrémité est de la pointe Chébucto

Nouveau-Brunswick

6. le port de Saint-Jean
7. la baie de Miramichi
8. la baie de Nepisiquit
9. le port de Dalhousie
10. le détroit de Shippegan

Québec

11. le fleuve Saint-Laurent

Ontario

12. le fleuve Saint-Laurent
13. la rivière Détroit
14. la rivière Sainte-Claire
15. la rivière Sainte-Marie

Colombie-Britannique

16. l'anse Alberni
17. le détroit de Quatsino
18. l'anse Jervis
19. le port de Prince Rupert
20. le fleuve Fraser, en aval de la rivière Pitt
21. la rivière Skeena en aval de Port Essington

QUEEN'S PRINTER FOR CANADA, OTTAWA, 1978 IMPRIMEUR DE LA REINE POUR LE CANADA, OTTAWA, 1978

Government of Canada
Department of Communications

Telecommunication
Regulatory Service

Gouvernement du Canada
Ministère des Communications

Service de la réglementation des
télécommunications

RIM-1-1

THIRD EDITION

SSTR

SHIP STATION TECHNICAL REGULATIONS

ESTABLISHED BY:

SOR/78-201

AMENDED BY:

SOR/80-181

NOTE

All persons making use of this consolidation are reminded that it has no Parliamentary sanction, that the amendments have been embodied only for convenience of reference, and that the original act and amendments thereto should be consulted for all purposes of interpreting and applying the law.

TROISIÈME ÉDITION

RTSN

RÈGLEMENT TECHNIQUE SUR LES STATIONS (RADIO) DE NAVIRES

ÉTABLI PAR:

DORS/78-201

MODIFIÉ PAR:

DORS/80-181

REMARQUE:

On rappelle aux lecteurs que la présente codification n'a aucune sanction Parlementaire, que les modifications y ont été incorporées aux seules fins d'en faciliter la consultation. Lorsqu'il s'agit d'interpréter et d'appliquer la loi, c'est à la loi et aux modifications mêmes qu'il faut se reporter.

Registration
SOR/78-201 2 March, 1978

CANADA SHIPPING ACT

Ship Station Technical Regulations

The Minister of Transport, pursuant to section 404 of the Canada Shipping Act, is pleased hereby to revoke the Ship Station Radio Regulations, Part II, made by Order of 7th June 1966[1], as amended[2], and to make the annexed Ship Station Technical Regulations in substitution therefor, effective June 1st, 1978

Dated at Ottawa, February 24, 1978

O. E. LANG
Minister of Transport

Enregistrement
DORS/78-201 2 mars 1978

LOI SUR LA MARINE MARCHANDE DU CANADA

Règlement technique sur les stations (radio) de navires

En vertu de l'article 404 de la Loi sur la marine marchande du Canada, il plaît au ministre des Transports d'abroger le Règlement sur la radio pour les stations de navires, Partie II, établi par une ordonnance du 7 juin 1966[1], dans sa forme modifiée[2] et d'établir en remplacement, à compter du 1er juin 1978, le Règlement technique sur les stations (radio) de navires

Fait à Ottawa, le 24 février 1978

Le ministre des Transports
O. E. LANG

REGULATIONS RESPECTING THE TECHNICAL CHARACTERISTICS, INSTALLATION AND OPERATION OF RADIO STATIONS ON SHIPS

Short Title

1. These Regulations may be cited as the *Ship Station Technical Regulations*

Interpretation

2. In these Regulations,

""AMVER" means the Automated Mutual-Assistance Vessel Rescue System, (*AMVER*)" SOR/79-575

"Act" means the *Canada Shipping Act*; (*loi*)

"Chairman" means the Chairman of the Board of Steamship Inspection, (*président*)

"Department" means the Department of Transport; (*ministère*)

"existing radio installation" means a radio installation that is not a new radio installation; (*installation radio existante*)

"existing ship" means a ship that is not a new ship; (*navire existant*)

"HF coverage area" has the same meaning as in the *Ship Station Radio Regulations*; (*zones de couverture HF*)

"International Radio Regulations" means the Radio Regulations annexed to the International Telecommunication Convention, Malaga-Torremolinos, 1973; (*Règlement international des radiocommunications*)

"main radiotelegraph installation" means the main radiotelegraph installation required by section 14; (*installation radiotélégraphique principale*)

"MF coverage area" has the same meaning as in the *Ship Station Radio Regulations*; (*zones de couverture MF*)

RÈGLEMENT SUR LES CARACTÉRISTIQUES TECHNIQUES, L'INSTALLATION ET LE FONCTIONNEMENT DES STATIONS RADIO À BORD DES NAVIRES

Titre abrégé

1. *Règlement technique sur les stations (radio) de navires*

Définitions

2. On entend,

«AMVER» désigne le Système automatique d'entraide pour le sauvetage des navires; (*AMVER*)» DORS/79-575

«installation radio existante» une installation radio qui n'est pas nouvelle, (*existing radio installation*)

«installation radiotélégraphique de réserve» l'installation radiotélégraphique de réserve requise à l'article 14, (*reserve radiotelegraph installation*)

«installation radiotélégraphique principale» l'installation radiotélégraphique principale requise à l'article 14, (*main radiotelegraph installation*)

«journal de bord radio» le journal de bord radio requis au paragraphe 66(1), (*radio log*)

«loi» la *Loi sur la marine marchande du Canada*, (*Act*)

«mille» le mille marin international de 1 852 m, (*mile*)

«ministère» le ministère des Transports, (*Department*)

«navire existant» un navire qui n'est pas un navire nouveau, (*existing ship*)

«navire nouveau» un navire dont la construction ou la transformation débute après l'entrée en vigueur du présent règlement, (*new ship*)

SSTR-4

"mile" means an international nautical mile of 1852 metres; (*mille*)

"new ship" means a ship the construction or conversion of which is commenced after the coming into force of these Regulations; (*navire nouveau*)

"qualified operator" means a radio operator holding an appropriate certificate of proficiency issued under the provisions of the *Radio Act*, of a class prescribed in these Regulations, or an equivalent certificate issued by and acceptable to a government of a country other than Canada and acceptable to the Minister; (*opérateur qualifié*)

"radio log" means the radio log required by subsection 66(1); (*journal de bord radio*)

"reserve radiotelegraph installation" means the reserve radiotelegraph installation required by section 14; (*installation radiotélégraphique de réserve*)

"tons" means gross tons; (*tonneaux*)

"VHF coverage area" has the same meaning as in the *Ship Station Radio Regulations*. (*zones de couverture VHF*)

Application

3. (1) These Regulations, other than sections 56 to 58, apply to every ship station fitted

(*a*) on a Canadian ship, and

(*b*) on a non-Canadian ship engaged in the coasting trade of Canada,

pursuant to the *Ship Station Radio Regulations*.

(2) Subsections 39(1) and (2), section 50, paragraph 60(2)(*b*) and subsection 60(3) apply to every ship station required, pursuant to the *Ship Station Radio Regulations*, to be fitted on a non-Canadian ship that is in Canadian waters and not engaged in the coasting trade of Canada.

(3) Section 56 applies to every radiotelegraph ship station required to be fitted on a motor lifeboat pursuant to the *Life Saving Equipment Regulations*.

(4) Section 57 applies to every portable radio apparatus required to be carried on a ship pursuant to the *Life Saving Equipment Regulations*.

(5) Section 58 applies to every radio direction finding apparatus required to be fitted on a ship pursuant to the *Navigating Appliances Regulations*.

(6) In addition to the ship stations referred to in subsection (1), sections 6, 12, 59, 69 and 70 apply to every ship station fitted on

(*a*) a Canadian ship in any water; and

(*b*) a non-Canadian ship in Canadian waters.

Compliance with Regulations

4. The owner and master of a ship fitted with a ship station or radio apparatus to which these Regulations apply shall

RTSN-4

«opérateur qualifié» un opérateur radio titulaire d'un certificat de compétence approprié délivré en vertu de la *Loi sur la radio*, d'une classe prescrite dans le présent règlement, ou titulaire d'un certificat équivalent délivré et agréé par le gouvernement d'un pays autre que le Canada et agréé par le ministre, (*qualified operator*)

«président» le président du Bureau d'inspection des navires à vapeur, (*Chairman*)

«Règlement international des radiocommunications» le Règlement des radiocommunications annexé à la Convention internationale sur les télécommunications, Malaga-Torremolinos, 1973, (*International Radio Regulations*)

«tonneaux» les tonneaux de jauge brute, (*tons*)

«zones de couverture HF» les zones définies par le *Règlement sur les stations radio de navires*, (*HF coverage area*)

«zones de couverture MF» les zones définies par le *Règlement sur les stations radio de navires*, (*MF coverage area*)

«zones de couverture VHF» les zones définies par le *Règlement sur les stations radio de navires*, (*VHF coverage area*)

Application

3. (1) Le présent règlement, sauf les articles 56 à 58, s'applique à toute station de navire installée à bord

a) d'un navire canadien, et

b) d'un navire non canadien affecté au cabotage au Canada,

conformément au *Règlement sur les stations radio de navires*.

(2) Les paragraphes 39(1) et (2), l'article 50, l'alinéa 60(2)*b*) et le paragraphe 60(3) s'appliquent aux stations de navire qui doivent être installées, conformément au *Règlement sur les stations radio de navires*, à bord de tout navire non canadien qui se trouve dans les eaux canadiennes et qui n'est pas affecté au cabotage au Canada.

(3) L'article 56 s'applique à toute station de navire radiotélégraphique qui doit être installée à bord de toute embarcation de sauvetage à moteur conformément au *Règlement sur l'équipement de sauvetage*.

(4) L'article 57 s'applique à tout appareil de radiocommunications portatif que tout navire doit avoir à bord conformément au *Règlement sur l'équipement de sauvetage*.

(5) L'article 58 s'applique à tout radiogoniomètre installé à bord d'un navire conformément au *Règlement sur les appareils de navigation*.

(6) Outre les stations de navire visées au paragraphe (1), les articles 6, 12, 59, 69 et 70 s'appliquent à toute station installée à bord

a) d'un navire canadien, quelles que soient les eaux où il se trouve, et

b) d'un navire non canadien dans les eaux canadiennes.

Conformité avec le règlement

4. Le propriétaire et le capitaine d'un navire ayant une station de navire ou un appareil de radiocommunications

SSTR-4A

ensure that the provisions of these Regulations are complied with.

"Equivalents

4.1 Where these Regulations require the provision or fitting of any particular equipment in a ship, or a particular provision to be made in a ship, or prescribe a particular characteristic in respect of any equipment in a ship, the Chairman may, on receipt of an application containing full details of the circumstances made to him by the owner of the ship or his authorized representative, permit any other equipment to be provided or fitted in the ship, or any other provision to be made in the ship, or any other characteristic in respect of any equipment in the ship if such other equipment, provision or characteristic is at least equivalent to that required or prescribed by these Regulations."

SOR/79-575

RTSN-4A

auquel ce règlement s'applique doivent s'assurer que les dispositions du présent règlement sont observées.

«Équivalences

4.1 Lorsque le présent règlement exige la fourniture ou l'installation d'un équipement spécial ou la prise d'une disposition particulière à bord d'un navire, ou prescrit pour l'équipement du navire une caractéristique particulière, le président peut, sur réception d'une demande présentée par le propriétaire du navire ou son représentant autorisé et énonçant toutes les circonstances, permettre tout autre équipement, disposition ou caractéristique s'ils sont au moins équivalents à ce que prescrit le présent règlement.»

DORS/79-575

PART I

RADIOTELEGRAPH AND RADIOTELEPHONE

DIVISION I

GENERAL

Compliance with Other Standards

5. Every ship station shall,

(*a*) comply with the technical requirements for licensing as a ship station prescribed in regulations made under the *Radio Act*; and

(*b*) be installed in accordance with the appropriate General Specification for installation of compulsorily fitted maritime mobile ship station equipment issued by the Canadian Coast Guard, Department of Transport and in effect at the time of installation.

6. For safety purposes, every ship station shall be operated in accordance with the provisions of the International Telecommunication Convention, Malaga-Torremolinos, 1973, and the International Radio Regulations.

Publication

7. Every ship station shall be provided with the publications listed in Schedule III.

Location, Protection and Equipping of Stations

8. Every ship station, exclusive of its main source of electrical energy, shall be placed in the upper part of a ship in a position of the greatest possible safety and so located that interference from mechanical, electrical or other noise is reduced to a minimum.

9. Every ship station and its operating positions shall

(*a*) be protected against the harmful effects of water and extremes of temperature;

(*b*) be readily accessible for immediate use in case of distress, and

(*c*) be readily accessible for maintenance purposes.

10. Where a ship station is designed for operation in the bridge area and is not located on the bridge, an efficient two-way system for calling and voice communication, independent of the ship's main source of electrical energy, shall be provided between the bridge and the location of the ship station.

11. (1) In respect of every ship on which a watch on 500 kHz or 2182 kHz frequency is required to be maintained, the ship station shall be provided with a reliable clock that is

PARTIE I

RADIOTÉLÉGRAPHIE ET RADIOTÉLÉPHONIE

DIVISION I

DISPOSITIONS GÉNÉRALES

Conformité avec les autres normes

5. Toute station de navire doit

a) répondre aux conditions techniques requises pour l'obtention d'une licence conformément aux règlements établis selon la *Loi sur la radio*, et

b) être installée conformément au cahier des charges général concernant l'installation obligatoire d'équipement de station maritime mobile, publié par la Garde côtière canadienne, ministère des Transports, et en vigueur au moment de l'installation.

6. Pour des raisons de sécurité, toute station de navire doit être utilisée conformément aux dispositions de la Convention internationale sur les télécommunications, Malaga-Torremolinos, 1973, et du Règlement international des radiocommunications.

Publication

7. Toute station de navire doit avoir les publications énumérées à l'annexe III.

Emplacement, protection et équipement des stations

8. Toute station de navire, à l'exclusion de sa source principale d'électricité, doit être placée dans la partie supérieure du navire, à un endroit offrant la plus grande sécurité possible et où le brouillage par des bruits d'origine mécanique, électrique ou autre est le plus faible.

9. Toute station de navire et ses postes de travail doivent

a) être protégés contre les effets nuisibles de l'eau et les températures extrêmes,

b) être facilement accessibles pour utilisation immédiate en cas de détresse, et

c) être facilement accessibles pour les fins d'entretien.

10. Lorsqu'une station de navire conçue pour utilisation sur la passerelle n'y est pas installée, une liaison téléphonique bidirectionnelle efficace, indépendante de la source principale d'électricité du navire, doit être prévue pour les appels et les conversations entre la passerelle et la station.

11. (1) La station de tout navire qui est tenu de maintenir un service d'écoute sur une fréquence de 500 kHz ou de 2 182 kHz doit avoir une pendule fiable

(*a*) equipped with a dial of not less that 12.5 centimetres in diameter, marked to indicate the silence periods prescribed in the International Radio Regulations;

(*b*) equipped with a concentric seconds hand;

(*c*) permanently installed in such a position that the dial can be accurately read by a qualified operator from the main operating position; and

(*d*) correctly regulated by the use of time signals or other means.

(2) Every ship station fitted solely with VHF radio-telephone equipment shall be equipped with a reliable device for indicating time visible from the main operating position.

12. All practical steps shall be taken to suppress and eliminate any radio interference affecting a ship station from electronic, electrical and other apparatus on board that ship.

DIVISION II

MEDIUM FREQUENCY (MF) RADIOTELEGRAPH STATION

Application

13. This Division applies in respect of every MF radio-telegraph ship station fitted on a ship.

General

14. Every MF radiotelegraph ship station shall consist of a main radiotelegraph installation and a reserve radiotelegraph installation.

15. (1) The radiotelegraph operating room for an MF radiotelegraph ship station shall be sufficient in size and adequately ventilated to ensure the efficient operation of the main and reserve radiotelegraph installations and shall not be used for any purpose that will interfere with such operation.

(2) There shall be sleeping accommodation for at least one radio officer situated as near as practical, but not within, the radiotelegraph operating room referred to in subsection (1).

16. An efficient two-way system for calling and voice communications, independent of a ship's main communication system and main source of electrical energy, shall be provided

(*a*) between the radiotelegraph operating room and the bridge of the ship; and

(*b*) where the ship may be navigated from one or more places other than the bridge, between the radiotelegraph operating room and one such place.

17. (1) A reliable emergency light operated from the source of electrical energy of the reserve radiotelegraph installation shall be permanently installed to provide satisfactory illumination of the operating controls of the main radiotelegraph installation and reserve radiotelegraph installation, and of the clock prescribed by section 11.

(2) The emergency light referred to in subsection (1) shall be controlled by a switch or switches, clearly marked to indicate their purpose, located in a place convenient to the

a) dont le cadran mesure au moins 12,5 cm de diamètre et porte l'indication des périodes de silence prescrites par le Règlement international des radiocommunications,

b) munie d'une trotteuse centrale,

c) installée à demeure en un point où tout opérateur qualifié puisse lire correctement le cadran du poste de travail principal, et

d) correctement réglée au moyen des signaux horaires ou d'autres procédés.

(2) Toute station de navire munie uniquement d'un équipement radiotéléphonique VHF doit avoir un dispositif fiable indiquant l'heure et visible du poste de travail principal.

12. Toutes les mesures doivent être prises pour supprimer et éliminer le brouillage d'une station de navire dû à des appareils électroniques, électriques ou autres à bord du navire.

DIVISION II

STATION RADIOTÉLÉGRAPHIQUE DE FRÉQUENCE MOYENNE (MF)

Application

13. La présente division s'applique à toute station radiotélégraphique MF installée à bord d'un navire.

Dispositions générales

14. Toute station radiotélégraphique MF doit comprendre une installation radiotélégraphique principale et une installation radiotélégraphique de réserve.

15. (1) La salle de radiotélégraphie d'une station MF doit être suffisamment grande et convenablement ventilée pour permettre le bon fonctionnement des installations radiotélégraphiques tant principales que de réserve et ne doit servir à aucun usage pouvant gêner le fonctionnement des appareils.

(2) Il doit y avoir un poste de couchage pour au moins un opérateur radio aussi près que possible de la salle de radiotélégraphie, mais jamais à l'intérieur de cette salle.

16. Une liaison téléphonique bidirectionnelle efficace, indépendante du réseau principal de communications du navire et de la source principale d'électricité, doit être établie

a) entre la salle de radiotélégraphie et la passerelle du navire et,

b) lorsque le navire peut être gouverné d'un ou de plusieurs points autres que la passerelle, entre la salle de radiotélégraphie et un tel point.

17. (1) Une lampe de secours fiable alimentée par la source d'électricité de l'installation radiotélégraphique de réserve doit être installée à demeure pour éclairer de façon satisfaisante les commandes de l'installation radiotélégraphique principale et de l'installation radiotélégraphique de réserve ainsi que la pendule visée à l'article 11.

(2) La lampe de secours doit être commandée par un ou plusieurs interrupteurs, portant une indication claire de leur usage, placés à un endroit approprié du poste de travail et de l'entrée principale de la salle de radiotélégraphie du navire.

operating position of and the main entrance to the radiotelegraph operating room of a ship.

18. Every radiotelegraph ship station shall be provided with,

(*a*) test equipment that includes

(i) an instrument for measuring AC volts, DC volts and ohms,

(ii) fuses of the proper value, and

(iii) the manufacturer's operating and maintenance manuals in respect of the radio equipment incorporated in the station;

(*b*) appropriate tools and replacement parts sufficient to ensure that the station is maintained in effective operating condition while at sea; and

(*c*) except where the antenna for the main radiotelegraph installation is of the self-supporting rigid type, a spare antenna completely assembled and ready for immediate installation to replace the antenna provided for the main installation.

19. A portable inspection light capable of being operated from the source of energy for the reserve radiotelegraph installation referred to in subsection 30(1) or a flashlight in effective operating condition shall be kept in the radiotelegraph operating room of a ship and be mounted in an easily accessible place.

20. Sufficient electrical energy shall be available in a ship at all times to operate the main radiotelegraph installation under normal conditions over the minimum normal range and to charge any batteries forming part of the main radiotelegraph installation or reserve radiotelegraph installation.

21. (1) Storage batteries used in conjunction with a radiotelegraph ship station shall be installed in a clean dry place that is protected from the elements and temperature extremes and be provided with adequate ventilation to the outer air.

(2) During the period a ship is at sea, storage batteries for both the main radiotelegraph installation and the reserve radiotelegraph installation of a radiotelegraph ship station shall be brought up to the normal fully charged condition daily by a qualified operator.

22. Every radiotelegraph installation shall be provided with a changeover device permitting rapid changeover from transmission to reception and vice versa without manual switching.

Alarm Signal Keying Device

23. (1) Every MF radiotelegraph ship station shall be provided with an automatic radiotelegraph alarm signal keying device capable of automatically keying the main and the reserve transmitters of the installations referred to in section 14 causing the transmission of the radiotelegraph alarm signal.

(2) The automatic radiotelegraph alarm signal keying device referred to in subsection (1) shall be capable of being taken out of operation at any time in order to permit immediate manual operation of the main or reserve transmitter and, where electrically operated, the keying device shall be capable

18. Toute station radiotélégraphique doit avoir

a) l'équipement suivant:

(i) un multimètre pour mesurer la tension du courant alternatif, du courant continu et la résistance,

(ii) des fusibles d'une capacité appropriée et

(iii) les manuels d'emploi et d'entretien du fabricant de l'équipement radio incorporé à la station,

b) des outils appropriés et des pièces de remplacement en quantité suffisante pour assurer le bon fonctionnement de la station en mer, et

c) une antenne de rechange entièrement montée et prête pour installation immédiate en remplacement de celle prévue pour l'installation principale, sauf lorsque l'antenne de l'installation radiotélégraphique principale est une antenne rigide autoportante.

19. Une baladeuse pouvant être alimentée par la source d'électricité de l'installation radiotélégraphique de réserve visée au paragraphe 30(1) ou une lampe torche en bon état de fonctionnement doivent être gardées dans la salle de radiotélégraphie du navire et être rangées en un lieu accessible.

20. Le navire doit avoir une source d'électricité suffisante capable d'alimenter en tout temps l'installation radiotélégraphique principale dans les conditions normales lorsqu'elle atteint sa portée normale minimale et de charger toute batterie faisant partie de l'installation radiotélégraphique principale ou de l'installation radiotélégraphique de réserve.

21. (1) Les accumulateurs de la station radiotélégraphique doivent être installés en un endroit propre et sec, à l'abri des éléments et des températures extrêmes, et ayant un orifice de ventilation suffisant donnant sur l'extérieur.

(2) Tant que le navire est en mer, un opérateur qualifié doit remonter quotidiennement à leur pleine charge normale les accumulateurs de l'installation radiotélégraphique principale et de l'installation radiotélégraphique de réserve.

22. Toute installation radiotélégraphique doit avoir un dispositif permettant de passer rapidement de l'émission à la réception ou inversement sans commutation manuelle.

Manipulateur de signal d'alarme

23. (1) Toute station radiotélégraphique MF doit avoir un manipulateur automatique de signal d'alarme radiotélégraphique capable de manipuler automatiquement l'émetteur principal et l'émetteur de réserve des installations visées à l'article 14 de façon à transmettre ce signal.

(2) Le manipulateur automatique doit pouvoir être déconnecté en tout temps afin de permettre immédiatement la manipulation de l'émetteur principal ou de l'émetteur de réserve et, lorsqu'il est commandé électriquement, le manipulateur doit pouvoir être alimenté par la même source d'électricité qui alimente l'installation radiotélégraphique de réserve.

of operating from the same source of energy provided for the reserve radiotelegraph installation.

(3) The automatic radiotelegraph alarm signal keying device referred to in subsection (1) shall, during the period a ship is at sea, be tested daily by a qualified operator using a suitable artificial antenna.

(3) Le manipulateur automatique doit, tant que le navire est en mer, être vérifié chaque jour par un opérateur qualifié utilisant une antenne fictive appropriée.

Radiotelegraph Auto Alarm

24. (1) Where, on a ship, a watch is kept by using a radiotelegraph auto alarm, that alarm shall give a continuous audible warning

(*a*) by actuation of the radiotelegraph auto alarm on receipt of the radiotelegraph alarm signal, or

(*b*) on failure of the radiotelegraph auto alarm,

and the warning shall continue until manually stopped.

Récepteur d'auto-alarme radiotélégraphique

24. (1) Lorsque, à bord d'un navire, l'écoute est assurée par un récepteur d'auto-alarme radiotélégraphique, ce récepteur doit produire un signal d'avertissement audible continu

a) par sa mise en action en recevant le signal d'alarme radiotélégraphique ou

b) en tombant en panne,

qui se fasse entendre tant que quelqu'un ne l'arrête pas manuellement.

(2) The audible warning referred to in subsection (1) shall be sounded

(*a*) in the radiotelegraph operating room,

(*b*) in the radio operator's sleeping quarters, and

(*c*) on the bridge

of the ship.

(2) Le signal d'avertissement doit être produit

a) dans la salle de radiotélégraphie,

b) dans le poste de couchage de l'opérateur radio et

c) sur la passerelle

du navire.

(3) There shall be only one switch provided for the purpose of stopping the audible warning referred to in subsection (1) and that switch shall be located in the radiotelegraph operating room.

(3) Il doit n'y avoir qu'un seul interrupteur pour interrompre le signal d'avertissement et il doit être placé dans la salle de radiotélégraphie.

(4) Where a radiotelegraph auto alarm is in operation on a ship, a qualified operator on that ship shall, on going off watch,

(*a*) test the efficiency of the radiotelegraph auto alarm receiver by

(i) connecting the receiver to its antenna, and

(ii) listening to signals and comparing the signals received with similar signals received on the frequency of 500 kHz on the receiver for the main radiotelegraph installation; and

(*b*) report any defect in the operation of the radiotelegraph auto alarm to the master or the person in charge of the deck watch.

(4) Lorsqu'il y a un récepteur d'auto-alarme radiotélégraphique en fonction à bord d'un navire, tout opérateur qualifié doit, en terminant son service de veille,

a) vérifier l'efficacité de ce récepteur

(i) en le connectant à son antenne et

(ii) en écoutant des signaux et en les comparant à des signaux similaires captés sur la fréquence de 500 kHz au moyen du récepteur de l'installation radiotélégraphique principale, et

b) signaler toute défectuosité de fonctionnement du récepteur au capitaine ou au responsable du quart à la passerelle.

(5) A qualified operator shall, at least once every twenty-four hours during the period a ship is at sea,

(*a*) test the radiotelegraph auto alarm using an alarm testing device; and

(*b*) report any defect in the operation of the radiotelegraph auto alarm to the master or the person in charge of the deck watch.

(5) Tout opérateur qualifié doit, au moins une fois toutes les vingt-quatre heures tant que le navire est en mer,

a) vérifier le fonctionnement du récepteur d'auto-alarme radiotélégraphique au moyen d'un appareil d'essai, et

b) signaler toute défectuosité de fonctionnement de ce récepteur au capitaine ou au responsable du quart à la passerelle.

(6) Where the radiotelegraph auto alarm is connected to an antenna, the master of the ship shall ensure that, where practicable, the accuracy of the radio direction finding apparatus fitted on the ship is not affected.

(6) Le capitaine du navire doit s'assurer que, lorsque le récepteur d'auto-alarme radiotélégraphique est connecté à une antenne, il ne nuise pas, si possible, à la précision du radiogoniomètre à bord du navire.

(7) The radiotelegraph auto alarm shall comply with the technical requirements set out in Schedule IV.

(7) Le récepteur d'auto-alarme radiotélégraphique doit être conforme aux conditions techniques visées à l'annexe IV.

SSTR-9

Main Radiotelegraph Installation

25. Subject to subsection 30(2), every main radiotelegraph installation shall be electrically separate and electrically independent of the reserve radiotelegraph installation and shall include,

(*a*) a transmitter;

(*b*) a receiver;

(*c*) a source of electrical energy; and

(*d*) an antenna.

26. (1) The transmitter for a main radiotelegraph installation shall

(*a*) when connected to the antenna for that installation, be capable of transmitting signals that, when transmitted by day from ship to ship under normal conditions, are clearly perceptible for a distance of

(i) 150 miles in the case where the transmission is from a passenger ship or from a cargo ship of 1,600 tons or more, and

(ii) 100 miles in the case where the transmission is from a cargo ship of less than 1,600 tons;

(*b*) be capable of

(i) transmitting

(A) on the distress frequency of 500 kHz using type A2 or A2H emission,

(B) on the direction finding frequency of 410 kHz using type A1, A2, or A2H emission and,

(C) on at least two of the following frequencies,

(I) 425 kHz,

(II) 454 kHz,

(III) 468 kHz,

(IV) 480 kHz, or

(V) 512 kHz;

using type A1 and type A2 or A2H emissions, and

(ii) switching from one frequency to another promptly and efficiently; and

(*c*) when using type A2 or A2H emission

(i) have a note frequency of not less than 500 and not more than 1,200 hertz, and

(ii) be modulated to a depth of not less than 70 per cent and not more than 95 per cent.

(2) For the purpose of paragraph (1)(*a*), the distances may be determined on the basis of metre-ampere measurement as follows:

(*a*) for 150 miles, 76 metre-amperes; and

(*b*) for 100 miles, 45 metre-amperes.

(3) For the purposes of subsection (2), the metre-ampere measurement shall be the product obtained by multiplying the distance in metres from the highest part of the antenna to the deepest load waterline by the antenna current in amperes.

27. The receiver for a main radiotelegraph installation shall,

RTSN-9

Installation radiotélégraphique principale

25. Sous réserve du paragraphe 30(2), toute installation radiotélégraphique principale doit être électriquement séparée et indépendante de l'installation radiotélégraphique de réserve et doit comprendre

a) un émetteur,

b) un récepteur,

c) une source d'électricité et

d) une antenne.

26. (1) L'émetteur de l'installation radiotélégraphique principale doit,

a) lorsqu'il est connecté à l'antenne de l'installation, pouvoir émettre des signaux qui, transmis le jour d'un navire à l'autre dans les conditions normales, soient clairement perceptibles jusqu'à une distance

(i) de 150 milles, dans le cas où l'émission est faite par un navire à passagers ou un navire de charge de 1 600 tonneaux ou plus, et

(ii) de 100 milles, dans le cas où l'émission est faite par un navire de charge de moins de 1 600 tonneaux,

b) pouvoir

(i) émettre,

(A) sur la fréquence de détresse de 500 kHz, une émission du type A2 ou A2H,

(B) sur la fréquence de 410 kHz utilisée en radiogoniométrie, une émission du type A1, A2 ou A2H et

(C) une émission sur au moins deux des fréquences suivantes:

(I) 425 kHz,

(II) 454 kHz,

(III) 468 kHz,

(IV) 480 kHz ou

(V) 512 kHz,

en utilisant des émissions du type A1 et du type A2 ou A2H et

(ii) passer promptement et efficacement d'une fréquence à l'autre et,

c) lorsqu'il produit des émissions du type A2 ou A2H,

(i) avoir une fréquence non inférieure à 500 ni supérieure à 1 200 Hz et

(ii) avoir un taux de modulation d'une profondeur d'au moins 70% et d'au plus 95%.

(2) Pour les fins de l'alinéa (1)*a*), les distances peuvent être déterminées suivant la mesure mètre-ampère de la façon suivante:

a) pour 150 milles, 76 mA, et

b) pour 100 milles, 45 mA.

(3) Pour les fins du paragraphe (2), la mesure mètre-ampère doit être le produit obtenu de la distance en mètres entre le sommet de l'antenne et la ligne de charge maximale et du courant en ampères de l'antenne.

27. Le récepteur de l'installation radiotélégraphique principale doit

SSTR-10

(*a*) be capable of efficiently receiving type A1, and type A2 or A2H emissions on all frequencies between 405 kHz and 535 kHz,

(*b*) be fitted with headphones that operate effectively; and

(*c*) have sufficient sensitivity to effectively operate, with a receiver input signal as low as 25 microvolts, the headphones referred to in paragraph (*b*) or, where a loudspeaker is connected, the loudspeaker.

28. The voltage of the source of electrical energy for the main radiotelegraph installation shall be maintained within plus or minus ten per cent of the rated input voltage of that installation.

29. (1) The transmitter and receiver for a main radiotelegraph installation shall be capable of being quickly connected with and tuned to the antennas for that installation and the reserve installation.

(2) The antenna for a main radiotelegraph installation shall be so designed and installed as to provide maximum practicable efficiency and, if suspended between supports liable to whipping, shall be suitably protected against breakage.

Reserve Radiotelegraph Installation

30. (1) Subject to subsection (2), every reserve radiotelegraph installation shall be electrically separate and electrically independent of the main radiotelegraph installation and shall include,

(*a*) a transmitter;

(*b*) a receiver;

(*c*) a source of electrical energy; and

(*d*) an antenna.

(2) Where the transmitter for a main radiotelegraph installation complies with all the requirements for the transmitter for a reserve radiotelegraph installation, a separate transmitter for the reserve installation is not required on a cargo ship of less than 1,600 tons.

31. (1) The transmitter for the reserve radiotelegraph installation shall,

(*a*) when connected to the antenna for the main radiotelegraph installation or that reserve radiotelegraph installation, be capable of transmitting signals that, when transmitted by day from ship to ship under normal conditions, are clearly perceptible for a distance of

(i) 100 miles, in the case where the transmission is from a passenger ship or from a cargo ship of 1,600 tons or more, and

(ii) 75 miles, in the case where the transmission is from a cargo ship of less than 1,600 tons;

(*b*) be capable of transmitting on the distress frequency of 500 kHz using a type A2 or A2H emission;

(*c*) have a note frequency of not less than 500 and not more than 1,200 hertz; and

(*d*) be modulated to a depth of not less than 70 per cent.

RTSN-10

a) pouvoir capter efficacement les émissions du type A1 et du type A2 ou A2H sur toutes les fréquences comprises entre 405 kHz et 535 kHz,

b) être muni d'un casque d'écoute qui fonctionne efficacement, et

c) avoir une sensibilité suffisante pour produire des signaux efficaces dans le casque d'écoute visé à l'alinéa *b*) ou le haut-parleur, s'il en est, lorsque la tension du signal à l'entrée du récepteur n'est que de 25 µV.

28. La tension de la source d'électricité de l'installation radiotélégraphique principale doit être maintenue à 10% près, en plus ou en moins, de la tension nominale à l'entrée de l'installation.

29. (1) L'émetteur et le récepteur de l'installation radiotélégraphique principale doivent pouvoir être rapidement connectés et accordés avec les antennes de cette installation et de l'installation de réserve.

(2) L'antenne de l'installation radiotélégraphique principale doit être conçue et installée de façon à donner le maximum d'efficacité possible et, si elle est suspendue entre des supports susceptibles de vibrer, elle doit être convenablement protégée contre toute rupture.

Installation radiotélégraphique de réserve

30. (1) Sous réserve du paragraphe 30(2), toute installation radiotélégraphique de réserve doit être électriquement séparée et indépendante de l'installation radiotélégraphique principale et doit comprendre

a) un émetteur,

b) un récepteur,

c) une source d'électricité et

d) une antenne.

(2) Lorsque l'émetteur de l'installation radiotélégraphique principale est conforme à toutes les exigences applicables à un émetteur d'installation radiotélégraphique de réserve, il n'est pas nécessaire d'avoir un émetteur distinct pour l'installation de réserve à bord d'un navire de charge de moins de 1 600 tonneaux.

31. (1) L'émetteur de l'installation radiotélégraphique de réserve doit,

a) lorsqu'il est connecté à l'antenne de l'installation radiotélégraphique principale ou à celle de l'installation radiotélégraphique de réserve, pouvoir émettre des signaux qui, transmis le jour d'un navire à l'autre dans les conditions normales, soient clairement perceptibles jusqu'à une distance

(i) de 100 milles, dans le cas d'un navire à passagers ou d'un navire de charge de 1 600 tonneaux ou plus, et

(ii) de 75 milles, dans le cas d'un navire de charge de moins de 1 600 tonneaux,

b) pouvoir émettre, sur la fréquence de détresse de 500 kHz, une émission du type A2 ou A2H,

c) avoir une fréquence non inférieure à 500 ni supérieure à 1 200 Hz, et

SSTR-11

(2) For the purpose of paragraph (1)(*a*), the distances may be determined on the basis of metre-ampere measurement as follows:

(*a*) for 100 miles, 45 metre-amperes; and

(*b*) for 75 miles, 34 metre-amperes.

(3) For the purposes of subsection (2), the metre-ampere measurement shall be the product obtained by multiplying the distance in metres from the highest part of the antenna to the deepest load waterline by the antenna current in amperes.

32. The receiver for a reserve radiotelegraph installation shall,

(*a*) be capable of efficiently receiving types A2 and A2H emissions on the frequency of 500 kHz;

(*b*) be connected to a loudspeaker, unless split headphones are used, for standing by on 500 kHz when the main radiotelegraph installation is operating on other frequencies; and

(*c*) have sufficient sensitivity to effectively operate, with a receiver input signal as low as 50 microvolts, the headphones referred to in paragraph (*b*) or, where a loudspeaker is connected, the loudspeaker.

33. All parts of a reserve radiotelegraph installation, including its source of electrical energy and its switchboard, shall be placed in the upper part of the ship in a position of the greatest possible safety and as high above the deepest load waterline as practicable.

34. The transmitter for a reserve radiotelegraph installation, if not used for communication, shall, during the period the ship is at sea, be tested daily by a qualified operator using a suitable artificial antenna and at least once during each voyage using the antenna for the reserve radiotelegraph installation.

35. The transmitter and receiver for a reserve radiotelegraph installation shall be capable of being quickly connected with and tuned to the antennas for that installation and the main radiotelegraph installation.

36. (1) The source of electrical energy for a reserve radiotelegraph installation shall be independent of the propelling power of the ship and of the ship's electrical system and shall be capable of being put into immediate operation by means of a switchboard located in the radiotelegraph operating room or readily accessible therefrom.

(2) Where the switchboard referred to in subsection (1) is not located in the radiotelegraph operating room, its location shall be capable of being illuminated.

(3) The source of electrical energy for a reserve radiotelegraph installation shall be used to supply

(*a*) the emergency light referred to in subsection 17(1), and

(*b*) where it is electrically operated, the automatic radiotelegraph alarm signal keying device,

and may be used to supply

RTSN-11

d) avoir un taux de modulation d'une profondeur d'au moins 70%.

(2) Pour les fins de l'alinéa (1)*a*), les distances peuvent être déterminées suivant la mesure mètre-ampère de la façon suivante:

a) pour 100 milles, 45 mA, et

b) pour 75 milles, 34 mA.

(3) Pour les fins du paragraphe (2), la mesure mètre-ampère doit être le produit obtenu de la distance en mètres entre le sommet de l'antenne et la ligne de charge maximale et du courant en ampères de l'antenne.

32. Le récepteur de l'installation radiotélégraphique de réserve doit

a) pouvoir capter efficacement les émissions des types A2 et A2H sur la fréquence de 500 kHz,

b) être connecté à un haut-parleur, sinon à un casque à deux écouteurs, permettant de garder l'écoute sur 500 kHz pendant que l'installation radiotélégraphique principale fonctionne sur d'autres fréquences, et

c) avoir une sensibilité suffisante pour produire des signaux efficaces dans le casque d'écoute visé à l'alinéa *b*) ou le haut-parleur, s'il en est, lorsque la tension à l'entrée du récepteur n'est que de 50 μV.

33. Les organes d'une installation radiotélégraphique de réserve, y compris sa source d'électricité et son tableau de distribution, doivent être placés dans la partie supérieure du navire, à un endroit offrant le plus de sécurité possible et aussi haut que possible au-dessus de la ligne de charge maximale.

34. Si l'émetteur de l'installation radiotélégraphique de réserve n'est pas utilisé pour les communications pendant que le navire est en mer, l'opérateur qualifié doit en vérifier le fonctionnement tous les jours au moyen d'une antenne fictive appropriée et une fois au moins au cours de chaque voyage au moyen de l'antenne de l'installation radiotélégraphique de réserve.

35. L'émetteur et le récepteur de l'installation radiotélégraphique de réserve doivent pouvoir être rapidement connectés et accordés avec les antennes de cette installation et de l'installation radiotélégraphique principale.

36. (1) La source d'électricité de l'installation radiotélégraphique de réserve doit être indépendante de l'appareil propulsif et du système électrique du navire et doit pouvoir être mise immédiatement en service grâce à un tableau de distribution placé dans la salle de radiotélégraphie ou en un lieu facilement accessible depuis cette salle.

(2) Lorsque le tableau de distribution n'est pas situé dans la salle de radiotélégraphie, il doit pouvoir être éclairé.

(3) La source d'électricité de l'installation radiotélégraphique de réserve doit servir à alimenter

a) la lampe de secours visée au paragraphe 17(1) et

b) le manipulateur automatique de signal d'alarme radiotélégraphique, s'il fonctionne à l'électricité,

et peut servir à alimenter

(c) the radiotelegraph auto alarm referred to in subsection 24(1),

(d) any radio direction finding apparatus fitted on the ship, and

(e) the changeover device referred to in section 22.

(4) The source of electrical energy for a reserve radiotelegraph installation shall have sufficient capacity as determined by subsection (6) to operate the transmitter and receiver for that installation and the emergency light referred to in subsection 17(1) for at least six hours continuously under normal working conditions and shall be maintained at full efficiency during the period the ship is at sea.

(5) The source of electrical energy for a reserve radiotelegraph installation shall be tested daily by a qualified operator.

(6) For the purpose of subsection (4), the source of electrical energy has sufficient capacity if the electrical energy referred to in that subsection is equal to the aggregate of,

(a) one half the transmitter current consumption when operated with the key down (mark);

(b) one half the transmitter current consumption when operated with the key up (space); and

(c) the current consumption of the receiver and additional circuits connected to the reserve source of electrical energy.

37. The antenna for a reserve radiotelegraph installation shall be designed and installed so as to provide maximum practicable efficiency in time of emergency.

DIVISION III

RADIOTELEPHONE SHIP STATIONS

Application

38. This Division applies in respect of every radiotelephone ship station fitted on a ship.

General

39. (1) The main operating position of every radiotelephone ship station shall be located on the bridge convenient to the conning position and an operator shall, at any time, be able to assume operational control of that ship station at that location.

(2) A light or lights, permanently located in a fixed position, whose source of electrical energy is independent of the source of electrical energy that provides the normal lighting of the radiotelephone ship station referred to in subsection (1), shall be provided, for use only in an emergency, to illuminate,

(a) the operating controls of the radiotelephone ship station;

(b) the clock referred to in section 11; and

(c) the card of instructions required by subsection (3).

(3) A card of instructions setting out a clear summary of the radiotelephone distress procedures shall be posted in full view at the main operating position of every radiotelephone ship station.

(4) There shall be available at every radiotelephone station the manufacturer's operating and maintenance manuals in

c) le récepteur d'auto-alarme radiotélégraphique visé au paragraphe 24(1),

d) tout radiogoniomètre installé à bord du navire et

e) le dispositif de commutation visé à l'article 22.

(4) La source d'électricité d'une installation radiotélégraphique de réserve doit être d'une capacité suffisante, telle qu'indiquée au paragraphe (6), pour alimenter l'émetteur et le récepteur de l'installation ainsi que la lampe de secours visée au paragraphe 17(1), durant au moins six heures continues, dans les conditions normales de travail, et elle doit être gardée en état de servir à plein rendement tant que le navire est en mer.

(5) La source d'électricité doit être vérifiée tous les jours par un opérateur qualifié.

(6) Pour les fins du paragraphe (4), la source d'électricité est censée avoir une capacité suffisante si la capacité électrique visée à ce paragraphe est égale à la somme

a) de la moitié de la consommation de courant de l'émetteur lorsque le manipulateur est baissé (signal),

b) de la moitié de la consommation de courant de l'émetteur lorsque le manipulateur est levé (intervalle) et

c) du courant consommé par le récepteur et les autres circuits connectés à la source d'électricité de réserve.

37. L'antenne de toute installation radiotélégraphique de réserve doit être conçue et installée de façon à être le plus efficace possible en période d'urgence.

DIVISION III

STATIONS RADIOTÉLÉPHONIQUES DE NAVIRE

Application

38. La présente division s'applique à toute station radiotéléphonique installée à bord d'un navire.

Dispositions générales

39. (1) Le poste de travail principal d'une station radiotéléphonique doit être situé sur la passerelle en un point commode pour le poste de commandement et l'opérateur doit, en tout temps, pouvoir prendre la direction de la station du navire en ce point.

(2) Une ou plusieurs lampes, situées en permanence en un point fixe, dont la source d'électricité est indépendante de celle qui assure l'éclairage normal de la station radiotéléphonique, doivent être prévues pour éclairer seulement dans les cas d'urgence

a) les commandes de la station radiotéléphonique,

b) la pendule visée à l'article 11, et

c) le tableau d'instructions qu'exige le paragraphe (3).

(3) Un tableau d'instructions résumant clairement les procédures radiotéléphoniques de détresse doit être affiché bien en vue au poste de travail principal de toute station radiotéléphonique.

(4) Toute station radiotéléphonique doit avoir le manuel d'emploi et le manuel d'entretien du fabricant, ainsi que des

respect of the radiotelephone and spare parts, fuses and lamps that may be used as replacement items for installation by non-technical personnel.

40. Where a ship is operating north of 65° north latitude, every radiotelephone installation shall be provided with a spare antenna completely assembled and capable of quickly replacing its main antenna.

Reserve Source of Energy

41. (1) Subject to subsections (2) to (4), every ship shall be provided with a reserve source of electrical energy and distribution facilities, situated in the upper part of the ship independent of the propelling power of the ship and the ship's main electrical system, for the operation of the installations and equipment referred to in subsection (5).

(2) Subsection (1) does not apply to an existing ship, other than a passenger ship of 1,000 tons or more or a Safety Convention Cargo ship of 500 tons or more, until January 1, 1980.

(3) Where the main source of electrical energy for a radiotelephone ship station includes all the requirements set out in this section applicable to the reserve source of electrical energy referred to in subsection (1), a reserve source of electrical energy is not required.

(4) Where compliance with the requirement of subsection (1) to situate the reserve source of electrical energy and distribution facilities in the upper part of the ship would, on a ship registered in Canada continuously since the coming into force of these Regulations, require replacement of the associated radiotelephone equipment or major changes to the electrical system, the reserve source of electrical energy and distribution facilities shall be situated as high as practicable in the hull.

(5) The reserve source of electrical energy referred to in subsection (1), whether derived from an auxiliary generator, the ship's emergency generator, storage batteries or other means, shall be capable of being put into immediate operation in the event of failure of the main source of electrical energy, and shall have sufficient capacity as determined by subsection (8) to supply electrical energy for a period of six hours under normal working conditions to the following:

(*a*) one VHF radiotelephone installation;

(*b*) one MF radiotelephone installation or one combined MF/HF radiotelephone installation, in the case of a ship operating beyond the VHF coverage area; and

(*c*) the emergency lights fitted on the ship and the radiotelephone alarm signal device referred to in subsection 42(1) where the lights or device do not contain their own source of electrical energy.

(6) Where storage batteries are used to supply the reserve source of energy referred to in subsection (1), the batteries shall be

(*a*) installed in a clean dry place protected from the elements and temperature extremes;

(*b*) provided with adequate ventilation to the outer air; and

pièces de rechange, des fusibles et des lampes utilisables comme pièces de remplacement pour l'installation par le personnel non technique.

40. A bord de tout navire naviguant au nord de 65° de latitude nord, l'installation radiotéléphonique doit avoir une antenne de rechange entièrement assemblée et capable de remplacer rapidement l'antenne principale.

Source d'électricité de réserve

41. (1) Sous réserve des paragraphes (2) à (4), le navire doit avoir une source d'électricité de réserve et des installations de distribution, situées dans sa partie supérieure, indépendantes de l'appareil propulsif et du système électrique principal du navire pour l'alimentation des installations et appareils visés au paragraphe (5).

(2) Le paragraphe (1) ne s'applique pas à un navire existant, autre qu'un navire à passagers de 1 000 tonneaux ou plus ou qu'un navire de charge de 500 tonneaux ou plus de la Convention de sécurité, avant le 1er janvier 1980.

(3) Lorsque la source principale d'électricité de la station radiotéléphonique répond à toutes les exigences du présent article qui s'appliquent à la source d'électricité de réserve visée au paragraphe (1), une source d'électricité de réserve n'est pas requise.

(4) Si, afin de se conformer aux exigences du paragraphe (1), l'aménagement de la source d'électricité de réserve et des installations de distribution dans la partie supérieure du navire, exige sur un navire immatriculé au Canada sans interruption depuis l'entrée en vigueur du présent règlement le remplacement de l'équipement radiotéléphonique connexe et d'importants changements au système électrique, la source d'électricité de réserve et les installations de distribution doivent être installés le plus haut possible de la coque.

(5) La source d'électricité de réserve visée au paragraphe (1), qu'elle provienne d'une génératrice auxiliaire, de la génératrice de secours du navire, des accumulateurs ou d'autres sources à bord, doit pouvoir être mise en service immédiatement dans l'éventualité d'une panne de la source principale d'électricité et doit avoir une capacité suffisante, déterminée au paragraphe (8), pour alimenter durant six heures, dans les conditions normales de fonctionnement, les appareils suivants:

a) une installation radiotéléphonique VHF,

b) une installation radiotéléphonique MF ou une installation radiotéléphonique combinée MF/HF, dans le cas d'un navire naviguant au-delà de la zone de couverture VHF et

c) les lampes de secours installées sur le navire et le dispositif de signal d'alarme radiotéléphonique visé au paragraphe 42(1) lorsque les lampes ou le dispositif ne contiennent pas leur propre source d'électricité.

(6) Lorsque des accumulateurs constituent la source d'électricité de réserve visée au paragraphe (1), les batteries doivent être

a) installées en un endroit propre et sec et à l'abri des éléments et des températures extrêmes,

b) bien ventilées et mises en communication avec l'extérieur, et

(c) maintained in a fully charged condition during the period the ship is at sea

(7) A means shall be provided for assessing the state of charge of the batteries referred to in subsection (6)

(8) For the purpose of subsection (5), the reserve source of electrical energy has sufficient capacity if the electrical energy referred to in that subsection is equal to the aggregate of

(a) one half the current consumption necessary for speech transmission using the installations referred to in subsection (5);

(b) the current consumption of the receiver for the installations referred to in subsection (5), and

(c) the current consumption of all additional loads to which the reserve source of energy may supply power in time of distress or emergency

Medium Frequency (MF) Radiotelephone Alarm Signal Device

42. (1) Every MF radiotelephone installation shall be provided with a radiotelephone alarm signal device that

(a) is capable of generating the two-tone alarm signal prescribed by the International Radio Regulations;

(b) is capable of modulating the main MF or, where fitted, the combined MF/HF transmitter;

(c) may be taken out of operation at any time to permit normal operation of the transmitters of the ship stations; and

(d) if it does not contain its own source of energy, is capable of operating from the reserve source of electrical energy for the main MF radiotelephone installation

(2) Where the radiotelephone alarm signal device required by subsection (1) is portable, it shall, when not being used, be mounted in brackets and be easily accessible to an operator when he is located at the operating position of the ship station.

(3) The actuating switch for any radiotelephone alarm signal device shall be suitably protected against inadvertent operation and shall bear thereon a label to indicate that the radiotelephone alarm signal may only be transmitted when an emergency exists

(4) Provision shall be made for testing the radiotelephone alarm signal device referred to in subsection (1) without actuation of the radiotelephone transmitter

c) tenues pleinement chargées tant que le navire est en mer

(7) Doit être prévu un moyen d'évaluer la charge des batteries visées au paragraphe (6)

(8) Pour les fins du paragraphe (5), la source d'électricité de reserve est censée avoir une capacité suffisante si la capacité électrique visée à ce paragraphe est égale à la somme

a) de la moitié de la consommation de courant nécessaire pour la transmission de la parole au moyen des installations visées au paragraphe (5),

b) de la consommation de courant du récepteur des installations visé au paragraphe (5) et

c) de la consommation de courant de toutes les charges supplémentaires que la source d'électricité de reserve peut alimenter dans les cas de detresse ou d'urgence

Dispositif de signal d'alarme radiotéléphonique de fréquence moyenne (MF)

42. (1) Toute installation radiotéléphonique MF doit avoir un dispositif de signal d'alarme radiotéléphonique

a) capable de produire le signal d'alarme à deux fréquences prescrit par le Règlement international des radiocommunications,

b) capable de moduler l'émetteur MF principal ou, s'il en est, l'émetteur MF/HF combiné,

c) dont le fonctionnement peut être déconnecté en tout temps pour permettre aux émetteurs des stations du navire de fonctionner normalement, et

d) capable, si elle ne comprend pas sa propre source d'électricité, de s'alimenter à la source d'électricité de réserve de l'installation radiotéléphonique MF principale

(2) Lorsque le dispositif de signal d'alarme radiotéléphonique est portatif, il doit, lorsqu'il n'est pas utilisé, être monté sur des équerres et être facilement accessible à tout opérateur situé au poste de travail de la station du navire

(3) La commande de tout dispositif de signal d'alarme radiotéléphonique doit être protégée convenablement contre toute manipulation accidentelle et porter l'indication que le signal d'alarme radiotéléphonique ne peut être transmis que dans les situations d'urgence.

(4) Des dispositions doivent être prises pour vérifier le fonctionnement du dispositif de signal d'alarme radiotéléphonique sans faire fonctionner l'émetteur radiotéléphonique

"Radiotelephone Distress Frequency Watch Receiver Installation

42.1 (1) The radiotelephone distress frequency watch receiver installation shall be located at the place on board from which the ship is normally navigated and shall include

(*a*) a receiver;

(*b*) a loudspeaker;

(*c*) a filtering unit or a muting device to silence the loudspeaker in the absence of any of the signals referred to in subsection (4); and

(*d*) a suitable antenna, which shall normally be connected to the radiotelephone distress frequency watch receiver.

(2) The radiotelephone distress frequency watch receiver referred to in subsection (1) shall

(*a*) be fixed in tune on the frequency 2182 kHz and be capable of receiving signals of at least classes A2, A2H, A3 and A3H emissions; and

(*b*) for classes A3 and A3H emissions, have a receiver sensitivity equal to or better than 30 microvolts for a signal-to-noise ratio of 20 dB at the audio output terminals.

(3) The filtering unit referred to in paragraph (1)(*c*) shall

(*a*) select the frequencies 1300 Hz and 2200 Hz;

(*b*) have a frequency tolerance of not more than plus or minus 1.5 per cent;

(*c*) as far as possible, suppress frequencies outside the limits; and

(*d*) provide a facility to manually switch the filtering unit in and out of the circuit

(4) The muting device referred to in paragraph (1)(*c*) shall respond, by opening to the full audio pass band condition, to

(*a*) the radiotelephone alarm signal as defined in the ITU Radio Regulations; and

(*b*) the signal preceding a vital navigational warning as defined in those Regulations.

(5) The equipment referred to in subsection (1), shall, if provided with a muting device, have provision for:

(*a*) switching, by manual means, to the full audio pass band condition;

(*b*) switching, by manual means only, to the mute condition after the mute has been lifted; and

(*c*) routine testing of the muting device without causing signals to be radiated.

(6) Provision shall be made for protecting the receiver and muting its output when the ship's own transmitter is radiating on 2182 kHz." SOR/81-441

Test of Radiotelephone Ship Stations

43 (1) A qualified operator shall test

(*a*) the efficiency of every radiotelephone ship station each day that the ship is at sea unless the normal use of the equipment indicates that it is in proper operating condition;

(*b*) the capacity of each reserve source of electrical energy each day that the ship is at sea, where that source is intended to supply only a radiotelephone installation; and

(*c*) the capacity of each reserve source of electrical energy before leaving port and weekly thereafter while the ship is at

«Récepteur de veille sur la fréquence radiotéléphonique de détresse

42.1 (1) Le récepteur de veille sur la fréquence radiotéléphonique de détresse doit être installé à bord, au poste d'où le navire est normalement dirigé, et il doit comprendre:

a) un récepteur;

b) un haut-parleur;

c) un filtre ou un dispositif de réglage silencieux permettant de rendre le haut-parleur silencieux en l'absence de l'un des signaux mentionnés au paragraphe (4); et

d) une antenne appropriée qui doit normalement être raccordée au récepteur de veille sur la fréquence radiotéléphonique de détresse.

(2) Le récepteur de veille sur la fréquence radiotéléphonique de détresse mentionné au paragraphe (1) doit:

a) être préréglé sur la fréquence 2182 kHz et pouvoir capter au moins les émissions des classes A2, A2H, A3 et A3H; et

b) pour les émissions des classes A3 et A3H, avoir une sensibilité de réception égale ou supérieure à 30 μV pour un rapport signal/bruit de 20 dB aux bornes de sortie audio.

(3) Le filtre mentionné à l'alinéa (1)*c*) doit:

a) choisir les fréquences 1300 Hz et 2200 Hz;

b) avoir une tolérance sur la fréquence de plus ou moins 1.5% au plus;

c) autant que possible, supprimer les fréquences qui dépassent les limites susmentionnées; et

d) être muni d'un moyen de commutation manuelle

(4) Le dispositif de réglage silencieux mentionné à l'alinéa (1)*c*) doit réagir, par ouverture au mode complet de la bande passante audio,

a) au signal d'alarme radiotéléphonique défini dans le Règlement des radiocommunications de l'UIT; et

b) au signal précédant un avertissement vital pour la navigation et défini dans le Règlement des radiocommunications de l'UIT.

(5) Si l'équipement mentionné au paragraphe (1) est muni d'un dispositif de réglage silencieux, il doit être muni de moyens permettant

a) la commutation manuelle au mode complet de la bande passante audio;

b) la commutation, manuelle seulement, au mode silencieux, une fois faite la commutation; et

c) l'essai courant du dispositif de réglage silencieux sans causer de rayonnement de signaux.

(6) Des dispositions doivent être prises pour protéger le récepteur et pour le rendre silencieux lorsque l'émetteur du navire émet sur 2182 kHz.» DORS/81-441

Vérification du fonctionnement des stations radiotéléphoniques de navire

43. (1) Un opérateur qualifié doit vérifier,

a) chaque jour et aussi longtemps que le navire est en mer, l'efficacité de toute station radiotéléphonique à moins que l'utilisation normale de l'équipement n'indique qu'il est en bon état de fonctionnement,

b) chaque jour et aussi longtemps que le navire est en mer, la capacité de chaque source d'électricité de réserve, destinée à n'alimenter qu'une installation radiotéléphonique et,

sea, where such source is intended to supply all emergency equipment including the radiotelephone installation.

(2) A qualified operator shall, when testing any transmitter of a ship station, use the antenna normally used for the transmitter being tested.

(3) Where a test required by subsection (1) indicates that the equipment in respect of the radiotelephone ship station or the reserve source of electrical energy is not functioning properly, the equipment or source of energy shall be restored to an effective operating condition as soon as possible.

Medium Frequency (MF) Radiotelephone Installations

44. (1) Every MF radiotelephone installation shall include

(*a*) a transmitter;

(*b*) a receiver;

(*c*) an operating position;

(*d*) a main source of energy; and

(*e*) an antenna.

(2) Every MF radiotelephone installation referred to in subsection (1) shall be capable of

(*a*) transmitting and receiving type A3H and type A3A or A3J upper sideband emissions in the frequency band 1605 to 2850 kHz on at least the following channels:

(i) 2182 kHz,

(ii) one inter-ship channel appropriate to the area of operation, and

(iii) one ship to shore public correspondence channel appropriate to the area of operation; and

(*b*) switching between transmit and receive on any one channel in less than two seconds, and of switching from one channel to another in less than ten seconds.

45. The transmitter for an MF radiotelephone installation shall, when operating on 2182 kHz using type A3H emission, be capable of

(*a*) delivering at least 25 watts of unmodulated carrier power into a ship antenna of average characteristics; and

(*b*) transmitting clearly perceptible signals from ship to ship by day and under normal propagation conditions over a distance of at least 150 miles.

46. The receiver for an MF radiotelephone installation shall

(*a*) in addition to possessing the capabilities set out in paragraphs 44(2)(*a*) and (*b*), be capable of receiving type A3, A3H and type A3A or A3J emissions on frequencies that are appropriate to the area of operation and that are within the band 1605 to 2850 kHz used for the transmission by radiotelephone of meteorological messages and other communications relating to the safety of navigation; and

(*b*) have sufficient sensitivity to effectively operate a loudspeaker when the received signal, across a 50 ohm input

c) avant de quitter le port et chaque semaine suivante pendant que le navire est en mer, la capacité de chaque source d'électricité de réserve destinée à alimenter tout l'équipement de secours, y compris l'installation radiotéléphonique.

(2) Tout opérateur qualifié doit, lorsqu'il vérifie le fonctionnement d'un émetteur d'une station du navire, utiliser l'antenne normalement utilisée avec l'émetteur en vérification.

(3) Lorsque la vérification visée au paragraphe (1) indique que l'équipement de la station radiotéléphonique ou la source d'électricité de réserve ne fonctionne pas correctement, il faut remettre en état de fonctionner efficacement cet équipement ou cette source le plus tôt possible.

Installations radiotéléphoniques de fréquence moyenne (MF)

44. (1) Chaque installation radiotéléphonique MF doit comprendre

a) un émetteur,

b) un récepteur,

c) un poste de travail,

d) une source principale d'électricité et

e) une antenne.

(2) L'installation radiotéléphonique MF visée au paragraphe (1) doit pouvoir

a) émettre et capter des émissions de bandes latérales supérieures du type A3H et du type A3A ou A3J dans la bande des fréquences 1 605 à 2 850 kHz sur au moins les voies suivantes:

(i) 2 182 kHz,

(ii) l'une des voies de communication entre navires, appropriée à la zone des opérations, et

(iii) l'une des voies de correspondance publique entre navire et terre, appropriée à la zone des opérations, et

b) passer de l'émission à la réception sur n'importe quelle voie en moins de deux secondes et passer d'une voie à une autre en moins de dix secondes.

45. L'émetteur de l'installation radiotéléphonique MF doit, lorsqu'il effectue une émission du type A3H sur 2 182 kHz, pouvoir

a) produire une onde porteuse non modulée d'une puissance de 25 W dans une antenne de navire de caractéristiques moyennes, et

b) émettre des signaux clairement perceptibles d'un navire à un autre, de jour, dans des conditions de propagation normale et sur une distance d'au moins 150 milles.

46. Le récepteur de l'installation radiotéléphonique MF doit,

a) en plus de posséder les capacités visées aux alinéas 44(2)*a*) et *b*), pouvoir capter les émissions des types A3, A3H et du type A3A ou A3J sur les fréquences qui sont appropriées à la zone des opérations et qui font partie de la bande comprise entre 1 605 et 2 850 kHz utilisée pour la transmission par radiotéléphone des messages météorologiques et d'autres communications relatives à la sécurité de la navigation, et

circuit, is as low as 1.5 microvolts for type A3A or A3J emission and 3 microvolts for type A3 or A3H emission.

47. The main source of electrical energy for an MF radiotelephone installation shall be available at all times to operate that installation efficiently under normal conditions over the minimum range set out in paragraph 45(*b*).

48. (1) The main antenna for every MF radiotelephone installation shall be installed as high as practicable on a ship in such a manner as to provide an essentially omnidirectional radiation pattern and shall be connected to that radiotelephone installation by the shortest possible path.

(2) Where a ship of 20 metres or more in length is fitted with only one MF or one combined MF/HF radiotelephone installation, a spare antenna completely assembled and capable of quickly replacing the main antenna for use on 2182 kHz shall be provided.

(3) An effective and essentially non-inductive ground or counterpoise system shall be installed and connected to every MF radiotelephone installation by the shortest possible path.

Combined Medium Frequency (MF) and High Frequency (HF) Radiotelephone Installation

49. (1) Every combined MF/HF radiotelephone installation shall be electrically separate and electrically independent of the MF radiotelephone installation and shall include,

(*a*) a transmitter;
(*b*) a receiver;
(*c*) an operating position;
(*d*) a main source of energy; and
(*e*) an antenna.

(2) Every combined MF/HF radiotelephone installation shall, in addition to meeting the requirements of section 42 and subsection 44(2), be capable of transmitting and receiving type A3A or A3J upper sideband emission on at least one two-frequency duplex ship to shore channel in each of the 4, 6 and 8 Megahertz Maritime Mobile bands as are appropriate to the area of operation.

(3) The transmitter for every combined MF/HF radiotelephone installation shall be capable of

(*a*) type A3H emission on 2182 kHz;
(*b*) subject to subsection (4), delivering at least 35 watts of unmodulated carrier power into a ship antenna of average characteristics; and
(*c*) transmitting clearly perceptible signals from ship to ship by day and under normal propagation conditions over a distance of at least 150 miles.

(4) Where a radiotelephone transmitter is installed before January 1, 1980, the unmodulated carrier power level referred

b) avoir une sensibilité suffisante pour faire fonctionner efficacement un haut-parleur lorsque le signal reçu au moyen d'un circuit d'entrée de 50 Ω n'est que de 1,5 μV pour les émissions du type A3A ou A3J et de 3 μV pour les émissions du type A3 ou A3H.

47. La source principale d'électricité d'une installation radiotéléphonique MF doit pouvoir en tout temps faire fonctionner l'installation efficacement dans les conditions normales pour la portée minimale visée à l'alinéa 45*b*).

48. (1) L'antenne principale de toute installation radiotéléphonique MF doit être installée aussi haut que possible à bord d'un navire de façon à produire un diagramme de rayonnement essentiellement omnidirectionnel et être connectée à cette installation par le chemin le plus court possible.

(2) Lorsqu'un navire de 20 m ou plus de longueur n'est muni que d'une installation radiotéléphonique MF ou que d'une installation radiotéléphonique combinée MF/HF, une antenne de rechange entièrement assemblée et capable de remplacer rapidement l'antenne principale pour utilisation sur la fréquence de 2 182 kHz doit être prévue.

(3) Une prise de terre efficace et essentiellement non inductive ou un contrepoids doit être installé et connecté à toute installation radiotéléphonique MF par le chemin le plus court possible.

Installation radiotéléphonique combinée à fréquence moyenne (MF) et à haute fréquence (HF)

49. (1) Toute installation radiotéléphonique combinée MF/HF doit être électriquement séparée et indépendante de l'installation radiotéléphonique MF et doit comprendre

a) un émetteur,
b) un récepteur,
c) un poste de travail,
d) une source principale d'électricité et
e) une antenne.

(2) Toute installation radiotéléphonique combinée MF/HF doit, en plus de répondre aux exigences de l'article 42 et du paragraphe 44(2), pouvoir émettre et capter des émissions du type A3A ou A3J sur bande latérale supérieure et sur au moins une voie duplex à deux fréquences de communication, entre navire et terre, dans chacune des bandes maritimes mobiles de 4, 6 et 8 MHz appropriée à la zone des opérations.

(3) L'émetteur de toute installation radiotéléphonique combinée MF/HF doit pouvoir

a) produire des émissions du type A3H sur la fréquence de 2 182 kHz,
b) sous réserve du paragraphe (4), produire une onde porteuse non modulée d'une puissance d'au moins 35 W dans une antenne de bord de caractéristiques moyennes, et
c) émettre des signaux clairement perceptibles d'un navire à un autre, de jour, dans des conditions de propagation normales et sur une distance d'au moins 150 milles.

(4) Dans le cas de tout émetteur radiotéléphonique installé avant le 1er janvier 1980, la puissance de l'onde porteuse non

to in paragraph (3)(*b*) may be less than 35 watts but not less than 25 watts.

Very High Frequency (VHF) Radiotelephone Installation

50. (1) Every VHF radiotelephone installation shall include

(*a*) a transmitter;

(*b*) a receiver; and

(*c*) an antenna.

(2) Every VHF radiotelephone installation shall be capable of

(*a*) transmitting and receiving type F3 emissions on

(i) the distress frequency of 156.8 MHz,

(ii) the primary inter-ship safety frequency of 156.3 MHz,

(iii) one public correspondence frequency, and

(iv) such other VHF channels as are required for safety purposes and appropriate to the area of operation;

(*b*) receiving type F3 emissions on

(i) a dedicated VHF channel used for the transmission of navigation warnings for the area in which the ship is navigating, or

(ii) where no dedicated frequency exists for the area referred to in subparagraph (i), any other frequency that provides navigation warnings; and

(*c*) switching between transmit and receive on any one channel in less than two seconds and of switching from one channel to another in less than five seconds.

51. (1) Subject to subsection (2), the transmitter for every VHF radiotelephone installation shall be capable of delivering at least 15 watts but not more than 25 watts of carrier power into the antenna systems referred to in section 54 and provision shall be made to reduce the transmitter carrier power to one watt or less, by means of a switch located at the main operating position.

(2) The requirement of subsection (1) for a transmitter carrier power of at least 15 watts does not apply

(*a*) to a VHF radiotelephone installation fitted on a ship before January 1, 1980, where that installation has a transmitter carrier power of at least 10 watts; or

(*b*) to a dredge or similar floating plant that carries a portable VHF radiotelephone with a self-contained antenna and complies in other respects with these Regulations.

52. The receiver for every VHF radiotelephone installation shall have sufficient sensitivity to effectively operate a loudspeaker when the received signal, across a 50 ohm input circuit, is as low as 2 microvolts.

53. (1) A main source of electrical energy shall be available at all times to operate simultaneously every VHF radiotelephone installation.

(2) Where storage batteries are used as the source of electrical energy required by subsection (1), the storage batteries shall

modulée visée à l'alinéa (3)*b*) peut être inférieure à 35 W, mais non à 25 W.

Installation radiotéléphonique à très haute fréquence (VHF)

50. (1) Toute installation radiotéléphonique VHF doit comprendre

a) un émetteur,

b) un récepteur et

c) une antenne.

(2) Toute installation radiotéléphonique VHF doit pouvoir

a) émettre et capter des émissions du type F3 sur

(i) la fréquence de détresse de 156,8 MHz,

(ii) la fréquence principale de 156,3 MHz pour les communications de sécurité entre les navires,

(iii) une fréquence de correspondance publique et

(iv) toute autre voie VHF nécessaire aux fins de sécurité et appropriées à la zone des opérations,

b) capter les émissions du type F3

(i) sur une voie VHF reservée pour la transmission des avertissements aux navigateurs dans la zone où le navire navigue ou,

(ii) lorsqu'aucune fréquence n'est réservée pour la zone visée au sous-alinea (i), sur toute autre fréquence pour la transmission des avertissements aux navigateurs, et

c) passer de l'émission à la réception sur n'importe quelle voie en moins de deux secondes et passer d'une voie à une autre en moins de cinq secondes.

51. (1) Sous réserve du paragraphe (2), l'émetteur de toute installation radiotéléphonique VHF doit pouvoir produire une onde porteuse d'au moins 15 W et d'au plus 25 W, dans les systèmes d'antenne visés à l'article 54 et il doit être prévu un moyen de réduire la puissance de l'onde porteuse produite par l'émetteur jusqu'à un watt ou moins au moyen d'un interrupteur situé au poste de travail principal.

(2) Les exigences du paragraphe (1) pour un émetteur d'onde porteuse d'au moins 15 W ne s'appliquent pas

a) à une installation radiotéléphonique VHF placée à bord d'un navire avant le 1er janvier 1980, lorsque cette installation produit une onde porteuse d'au moins 10 W, ni

b) à une drague ou engin flottant semblable qui est équipé d'un radiotéléphone VHF portatif avec antenne intégrée et qui est par ailleurs conforme au présent règlement.

52. Le récepteur de toute installation radiotéléphonique VHF doit avoir une sensibilité suffisante pour faire fonctionner efficacement un haut-parleur lorsque le signal reçu au moyen d'un circuit d'entrée de 50 Ω n'est que de 2 μV.

53. (1) Il doit y avoir en tout temps une source principale d'électricité capable de faire fonctionner simultanément toutes les installations radiotéléphoniques VHF.

(2) Lorsque des accumulateurs constituent la source principale d'électricité exigée par le paragraphe (1), ils doivent

a) être situés dans la partie supérieure du navire, sauf qu'à bord d'un navire existant mesurant moins de 20 m de

(*a*) be located in the upper part of the ship, except that on an existing ship of less than 20 metres in length, where it is impracticable to comply with this requirement, the batteries shall be located as high as practicable in the hull;

(*b*) be of sufficient capacity to operate every VHF installation required to be fitted on a ship under the *Ship Station Radio Regulations*;

(*c*) be provided with charging facilities capable of fully charging the batteries in six hours; and

(*d*) be provided with switching facilities located convenient to the VHF radiotelephone installation.

54. (1) The antenna for every VHF radiotelephone installation shall be

(*a*) capable of transmitting and receiving a vertically polarized signal;

(*b*) installed as high as practicable on a ship in such a manner as to provide an essentially omnidirectional radiation pattern; and

(*c*) connected to that installation by the shortest possible path.

(2) Where a ship of 20 metres or more in length is fitted with only one VHF radiotelephone installation, a spare antenna, with sufficient interconnecting cable if necessary and capable of quickly replacing the main antenna without retuning, shall be provided.

55. Where a second VHF radiotelephone installation is fitted on a ship, it shall be electrically separate and electrically independent of and capable of being used simultaneously with the first VHF radiotelephone installation.

DIVISION IV

Motor Lifeboat Radiotelegraph Ship Stations

56. (1) Every radiotelegraph ship station required to be fitted on a motor lifeboat shall

(*a*) be capable of being used in an emergency by a person unskilled in the use of radiotelegraph;

(*b*) be installed in a cabin large enough to accommodate the equipment and the person using it;

(*c*) be arranged so that the efficient operation of the transmitter and receiver is not interfered with by the engine of the lifeboat while the engine is running or by the engine or battery charger when a battery is being charged;

(*d*) be provided with a fixed type of antenna and a mast for supporting the antenna at the maximum practicable height;

(*e*) be capable of transmitting and receiving signals on the frequencies of 500 kHz and 8,364 kHz, type A2 emission; and

(*f*) be provided with a battery source of electrical energy sufficient to give a minimum of 10 metre-amperes and maintain the installation in continuous operation for a period of six hours.

(2) The battery used for electrical energy for a radiotelegraph installation on a motor lifeboat shall

longueur, où il est impossible de se conformer à cette exigence, les batteries doivent être situées le plus haut possible dans la coque,

b) être de capacité suffisante pour faire fonctionner toutes les installations VHF que le *Règlement sur les stations radio de navires* exige d'installer à bord d'un navire,

c) avoir des installations capables de les charger entièrement en six heures, et

d) avoir des interrupteurs situés commodément près de l'installation radiotéléphonique VHF.

54. (1) L'antenne de toute installation radiotéléphonique VHF doit

a) pouvoir émettre et capter des signaux à polarisation verticale,

b) être installée aussi haut que possible à bord d'un navire de façon à produire un diagramme de rayonnement essentiellement omnidirectionnel, et

c) être connectée à l'installation par le plus court chemin possible.

(2) Lorsqu'un navire mesurant 20 m ou plus de longueur n'a qu'une seule installation radiotéléphonique VHF, il est prévu une antenne de rechange, pré-accordée, avec un câble d'interconnexion suffisamment long si nécessaire, et capable de remplacer rapidement l'antenne principale.

55. Lorsqu'une deuxième installation radiotéléphonique VHF est placée à bord d'un navire, elle doit être électriquement séparée et indépendante de la première installation radiotéléphonique VHF et capable d'être utilisée simultanément.

DIVISION IV

Stations radiotélégraphiques d'embarcations de sauvetage à moteur

56. (1) Toute station radiotélégraphique à installer à bord d'une embarcation de sauvetage à moteur doit

a) pouvoir être utilisée en cas d'urgence par une personne n'ayant aucune expérience de la radiotélégraphie,

b) être installée dans une cabine suffisamment grande pour recevoir l'équipement et la personne qui l'utilise,

c) être agencée de façon que l'émetteur et le récepteur puissent fonctionner efficacement lorsque le moteur de l'embarcation de sauvetage est en marche ou que le moteur ou le chargeur servent à charger une batterie,

d) avoir une antenne de type fixe et un mât pour supporter l'antenne à la plus grande hauteur possible,

e) pouvoir émettre et capter des émissions de signaux du type A2 sur les fréquences de 500 kHz et de 8 364 kHz, et

f) avoir une batterie comme source d'électricité capable de produire au minimum 10 mA et de la faire fonctionner sans arrêt durant six heures.

(2) La batterie utilisée comme source d'électricité pour l'installation radiotélégraphique d'une embarcation de sauvetage à moteur

(*a*) not be used for any purpose other than the operation of the installation or the searchlight required to be carried in the motor lifeboat; and

(*b*) where the battery is used to operate the searchlight, have capacity to supply electrical energy to operate the radiotelegraph installation and the searchlight at the same time.

(3) Where a battery used for electrical energy for a radiotelegraph installation on a motor lifeboat is of a type that requires charging, means shall be available for charging the battery

(*a*) from the power supply of the ship that carries the motor lifeboat; and

(*b*) on the lifeboat after the lifeboat has been launched from a ship

(4) The transmitter for a motor lifeboat radiotelegraph installation shall

(*a*) be modulated to a depth of not less than 70 per cent;

(*b*) have a note frequency of not less than 450 and not more than 1,350 hertz; and

(*c*) be fitted with an automatic keying device for the transmission of the radiotelegraph alarm signal and a distress signal prescribed in the International Radio Regulations and a key for manual transmission of the alarm and distress signal

(5) During the period a ship that is required to carry a motor lifeboat is at sea, a qualified operator shall, at weekly intervals,

(*a*) bring the battery referred to in paragraph (1)(*f*) up to full charge if the battery is of a type that requires charging; and

(*b*) test the transmitter for the motor lifeboat radiotelegraph installation using a suitable artificial antenna.

DIVISION V

Portable Radio Apparatus for Survival Craft

57. (1) Every portable radio apparatus required to be carried on board a ship shall

(*a*) be capable of being used in an emergency by a person unskilled in the use of such a radio;

(*b*) be kept in the chart room or other suitable place on the ship ready to be moved to a survival craft carried on the ship in the event of an emergency;

(*c*) be readily portable and watertight;

(*d*) be capable of

(i) floating in sea water, and

(ii) being dropped in the sea without damage;

(*e*) include an antenna that is self-supporting or capable of being supported by the mast of a survival craft at the maximum practicable height; and

(*f*) be capable of

(i) transmitting and receiving signals on the frequency of 500 kHz, type A2 emission, and transmitting on the frequency of 8364 kHz, type A2 emission, or

a) ne peut servir qu'à alimenter l'installation ou le projecteur que l'embarcation de sauvetage à moteur est tenue d'avoir à bord et,

b) lorsqu'elle sert à alimenter le projecteur, doit pouvoir alimenter en même temps l'installation radiotélégraphique et le projecteur.

(3) Lorsqu'une batterie utilisée comme source d'électricité pour une installation radiotélégraphique d'embarcation de sauvetage à moteur est de type rechargeable, il doit être possible de la recharger

a) à même la source d'électricité du navire où se trouve l'embarcation de sauvetage à moteur et

b) sur l'embarcation de sauvetage une fois mise à l'eau.

(4) L'émetteur de l'installation radiotélégraphique d'une embarcation de sauvetage à moteur doit avoir

a) un taux de modulation d'une profondeur d'au moins 70%,

b) une fréquence de modulation d'au moins 450 et d'au plus 1 350 Hz et

c) un manipulateur automatique pour la transmission du signal d'alarme radiotélégraphique et du signal de détresse prescrits dans le Règlement international des radiocommunications et un manipulateur pour la transmission manuelle des signaux d'alarme et de détresse.

(5) Lorsqu'un navire tenu d'avoir une embarcation de sauvetage à moteur est en mer, un opérateur qualifié doit, hebdomadairement,

a) remonter au maximum la charge de la batterie visée à l'alinéa (1)*f*) si elle est d'un type à rechargement, et

b) vérifier le fonctionnement de l'émetteur de l'installation radiotélégraphique de l'embarcation au moyen d'une antenne fictive appropriée.

DIVISION V

Appareils de radiocommunications portatifs pour les engins de sauvetage

57. (1) Tout appareil de radiocommunications portatif requis à bord d'un navire doit

a) pouvoir être utilisé en cas d'urgence par une personne qui n'a pas l'habitude d'utiliser un tel appareil,

b) être gardé dans la salle des cartes ou à tout autre endroit approprié du navire et être prêt à être placé sur l'engin de sauvetage à bord du navire en cas d'urgence,

c) être facilement transportable et être étanche,

d) pouvoir

(i) flotter sur l'eau de mer, et

(ii) être jeté à la mer sans être endommagé,

e) comprendre une antenne autoportante ou capable d'être supportée par le mât de l'engin de sauvetage à la plus grande hauteur possible, et

f) pouvoir

(i) émettre et capter des émissions de signaux du type A2 sur la fréquence de 500 kHz et transmettre une émission de type A2 sur la fréquence de 8 364 kHz ou

SSTR-20

(ii) transmitting and receiving signals on the frequency of 2182 kHz, type A3 or A3H emission.

(2) There shall be available to every portable radio apparatus required to be carried on a ship a source of electrical energy, derived from a hand generator or batteries, that is

(*a*) sufficient to supply at least 10 watts input to the final stage of the transmitter; and

(*b*) if batteries are used, sufficient to maintain the apparatus in continuous operation for a period of 4 hours.

(3) The transmitter for a portable radio apparatus shall,

(*a*) be modulated to a depth of not less than 70 per cent;

(*b*) in the case of a transmitter with the capability described in subparagraph (1)(*f*)(i), be fitted with an automatic keying device for the transmission of a radiotelegraph alarm signal and distress signal prescribed by the International Radio Regulations and a key for manual transmission of the alarm and distress signals; and

(*c*) in the case of a transmitter with the capability described in subparagraph (1)(*f*)(ii), be fitted with a device for generating the radiotelephone alarm signal prescribed in the International Radio Regulations and a microphone for voice transmissions.

(4) During the period a ship that is required to carry a portable radio is at sea, a qualified operator shall, at weekly intervals,

(*a*) test the transmitter for the radio using an artificial antenna; and

(*b*) where a battery source of electrical energy that requires charging is used for the radio, ensure that the battery is brought up to the normally charged condition.

DIVISION VI

Radio Direction Finding Apparatus

58. (1) Every radio direction finding apparatus required to be fitted on a ship shall

(*a*) be capable of receiving signals with a minimum of receiver noise on the frequencies of 285 to 325, 405 to 415 and 490 to 510 kHz;

(*b*) be capable of taking bearings from which the true bearing and direction may be determined;

(*c*) in the absence of interference, have a sensitivity sufficient to permit accurate bearings to be taken on a signal having a field strength as low as 50 microvolts per metre; and

(*d*) in the case of apparatus fitted after January 1, 1978, be capable of taking direction finding bearings on the radiotelephone distress frequency of 2182 kHz without ambiguity of sense within an arc of 30 degrees on either side of the bow of the ship.

(2) An efficient two-way means of calling and voice communication shall be provided between any radio direction finding apparatus fitted on a ship and the bridge of that ship.

RTSN-20

(ii) émettre et capter des émissions de signaux du type A3 ou A3H sur la fréquence de 2 182 kHz.

(2) Il doit y avoir pour chaque appareil de radiocommunications portatif requis à bord d'un navire une source d'électricité, provenant d'une génératrice manuelle ou de batteries, capable

a) de fournir au moins 10 W à l'entrée de l'étage final de l'émetteur et,

b) si des batteries sont utilisées, de faire fonctionner l'appareil sans arrêt durant quatre heures.

(3) L'émetteur d'un appareil de radiocommunications portatif doit

a) avoir un taux de modulation d'une profondeur d'au moins 70%,

b) s'il possède les caractéristiques décrites au sous-alinéa (1)*f*)(i), avoir un manipulateur automatique pour la transmission du signal d'alarme radiotélégraphique et du signal de détresse prescrits par le Règlement international des radiocommunications et un manipulateur pour la transmission manuelle des signaux d'alarme et de détresse et,

c) s'il possède les caractéristiques décrites au sous-alinéa (1)*f*)(ii), avoir un dispositif pour produire le signal d'alarme radiotéléphonique prescrit dans le Règlement international des radiocommunications et un microphone pour les émissions vocales.

(4) Lorsqu'un navire tenu d'avoir un appareil de radiocommunications portatif est en mer, un opérateur qualifié doit, hebdomadairement,

a) vérifier le fonctionnement de l'émetteur au moyen d'une antenne fictive, et

b) s'assurer, lorsque l'appareil radio est alimenté par une batterie qu'il faut charger, de remonter à la normale la charge de la batterie.

DIVISION VI

Radiogoniomètre

58. (1) Tout radiogoniomètre installé à bord d'un navire doit

a) pouvoir capter des signaux avec un minimum de bruit de fond du récepteur sur les fréquences de 285 à 325, 405 à 415 et 490 à 510 kHz,

b) pouvoir prendre des gisements à partir desquels il soit possible de déterminer le relèvement et la direction,

c) en l'absence de brouillage, avoir suffisamment de sensibilité pour permettre de prendre des gisements précis sur un signal ayant une intensité de champs de seulement 50 μV/m,

d) s'il est installé après le 1er janvier 1978, pouvoir prendre des gisements sur la fréquence radiotéléphonique de détresse de 2 182 kHz sans ambiguïté de sens à l'intérieur d'un arc de 30° d'un côté ou de l'autre de l'avant du navire.

(2) Un moyen efficace d'appel et de conversation en téléphonie doit être prévu entre tout radiogoniomètre installé à bord d'un navire et la passerelle du navire.

(3) The radio direction finding apparatus fitted on a ship shall

(*a*) be located on that ship at a place where the efficient determination of bearings will be affected as little as possible by mechanical or other noises; and

(*b*) be calibrated when first fitted and the calibration shall be verified by check bearings or by a further calibration whenever any changes are made in the position of any antennas or of any structure on deck that may appreciably affect the accuracy of the radio direction finding apparatus.

(4) The radio direction finding antenna system fitted on a ship shall be erected in such a manner that the efficient determination of bearings will be hindered as little as possible by the close proximity of other antennas, derricks, wire halyards or other large metal objects.

(5) The current calibration particulars of a radio direction finding apparatus fitted on a ship shall be checked at yearly intervals

(6) A record of the current calibrations referred to in subsection (5) and of the most recent checks as to the accuracy of the calibrations that are made shall be kept on board the ship and be available for inspection by a radio inspector.

(3) Le radiogoniomètre d'un navire doit être

a) placé à bord en un point où les bruits mécaniques ou autres troublent le moins possible la détermination efficace des gisements, et

b) étalonné lors de son installation, l'étalonnage devant être vérifié par des relèvements ou par un nouvel étalonnage chaque fois que des modifications de la position d'une antenne ou d'une construction sur le pont pourraient changer sensiblement la précision du radiogoniomètre

(4) Le système d'antenne du radiogoniomètre installé à bord d'un navire doit être monté de façon que les autres antennes, les mâts de charge, les drisses métalliques ou autres objets métalliques de grandes dimensions à proximité gênent le moins possible la détermination efficace des gisements.

(5) Les caractéristiques de l'étalonnage d'un radiogoniomètre installé à bord d'un navire doivent être vérifiées à des intervalles d'un an.

(6) Un registre des étalonnages et des vérifications les plus récentes des étalonnages doit être gardé à bord du navire et disponible à l'inspecteur de radio.

PART II

OPERATORS AND WATCHKEEPING

General

59. (1) Except in a case of distress, only the minimum power necessary to carry out a desired communication shall be used by the operator of a ship station

(2) During the period a ship, other than a government ship, is within a Canadian harbour

(*a*) no person on that ship shall operate a ship station unless it is operated

(i) for the purpose of making or answering signals of distress, urgency or safety,

(ii) to exchange with a Canadian coast or land station authorized to communicate with ship stations messages relating exclusively to the business of the ship, if other means of direct communication between the ship and the shore are impractical,

(iii) for inter-ship or ship to shore radiotelephone communications with a Canadian coast or land station using Maritime Mobile VHF frequencies, or

(iv) for on-board radiotelephone communications using UHF frequencies authorized for use in the area of the harbour; and

(*b*) the ship station fitted on that ship shall be rendered inoperative, where required by a radio inspector authorized by the Minister.

(3) Subject to subsection (4) and except in the case of distress, no person on board a warship that is not a Canadian

PARTIE II

OPÉRATEURS ET SERVICE D'ÉCOUTE

Dispositions générales

59. (1) Sauf en cas de détresse, l'opérateur d'une station de navire ne peut utiliser que le minimum d'électricité nécessaire pour effectuer les communications désirées.

(2) Durant le séjour d'un navire, autre qu'un navire de l'Etat, à l'intérieur d'un port canadien,

a) nul ne peut utiliser la station du navire sauf

(i) pour émettre des signaux de détresse, d'urgence ou de sécurité ou répondre à de tels signaux,

(ii) pour échanger avec une station côtière ou terrestre du Canada autorisée à communiquer avec les stations de navire des messages ayant exclusivement trait aux affaires du navire, s'il est impossible d'utiliser d'autres moyens de communication directe entre le navire et la côte,

(iii) pour établir des communications radiotéléphoniques entre navires ou entre le navire et une station côtière ou terrestre du Canada sur les fréquences VHF du service maritime mobile ou

(iv) pour les communications radiotéléphoniques à bord sur les fréquences UHF dont l'utilisation est autorisée dans la zone portuaire, et

b) la station du navire doit être retirée des ondes lorsqu'un inspecteur de radio autorisé par le ministre l'exige.

(3) Sous réserve du paragraphe (4) et sauf en cas de détresse, nul ne peut, à bord d'un navire de guerre non-

SSTR-22

warship shall use the ship station fitted on that warship during the period the warship is lying in a Canadian harbour.

(4) Where the Senior Naval Officer or, where there is no such officer, a radio inspector authorized by the Minister pursuant to section 406 of the Act, at or near the harbour referred to in subsection (3), receives a request from the Commanding Officer of the warship referred to in that subsection for permission to use the ship station fitted on the warship, stating the frequencies, types of emissions and the times of proposed transmission of signals, permission may be granted by the officer or inspector, as the case may be, to use the ship station.

(5) Every person shall

(*a*) for the purpose of transmitting a distress, urgency or safety radiocommunication signal, use the alarm, distress, urgency or safety signal prescribed in the International Radio Regulations; and

(*b*) when transmitting the distress radiocommunication signal referred to in the International Radio Regulations, comply with the requirements of the regulations annexed to the International Telecommunications Convention, Malaga-Torremolinos, 1973, in respect of such signals.

(6) Where, in the case of distress, the distress signal referred to in paragraph (5)(*a*) is to be transmitted by radiotelegraphy on the frequency of 500 kHz, the distress signal shall be immediately preceded by the transmission of the alarm signal referred to in that paragraph.

(7) Where, in any case other than distress, the transmitting of the alarm signal referred to in paragraph (5)(*a*) is permitted by the regulations annexed to the Safety Convention and the alarm signal has been transmitted, the transmission of any warning or message shall not begin until two minutes have elapsed following the termination of the alarm signal.

(8) The alarm and distress signals referred to in subsection (5) shall be used when a ship is in serious and imminent danger and requires immediate assistance.

(9) The urgency signal referred to in subsection (5) shall be used where assistance is required by a ship other than a ship referred to in subsection (8) or where it is desired to issue a warning that the alarm signal or the distress signal may be transmitted by the ship at a later time.

(10) Where a person has transmitted an alarm or distress signal from a ship and subsequently finds that assistance is no longer required, that person shall immediately notify all stations that may have acted on his previous signal that assistance is no longer required.

(11) The master of a ship, during the period the ship is at sea and on meeting in any area any of the following conditions,

(*a*) dangerous ice, a dangerous derelict or other dangers to navigation,

(*b*) a tropical storm or winds of a force of ten or more on the Beaufort scale for which no storm warning has been received, or

RTSN-22

canadien, utiliser la station du navire durant sont séjour dans un port canadien.

(4) Lorsque l'officier principal de marine ou, à défaut de cet officier, tout inspecteur de radio autorisé par le ministre en vertu de l'article 406 de la loi, au port ou près du port visé au paragraphe (3), reçoit du commandant du navire de guerre visé dans ce paragraphe, une demande d'autorisation d'utiliser la station du navire, indiquant les fréquences, les types d'émission et les heures de transmission projetée des signaux, il peut, selon le cas, accorder la permission d'utiliser la station du navire.

(5) Toute personne doit,

a) si elle a l'intention d'émettre un signal de radiocommunications de détresse, d'urgence ou de sécurité, utiliser le signal d'alarme, de détresse, d'urgence ou de sécurité prescrit par le Règlement international des radiocommunications et,

b) lorsqu'elle émet le signal de détresse visé dans le Règlement international des radiocommunications, se conformer aux exigences du règlement annexé à la Convention internationale sur les télécommunications, Malaga-Torremolinos, 1973, au sujet de ces signaux.

(6) Lorsque, en cas de détresse, le signal de détresse visé à l'alinéa (5)*a*) doit être émis en radiotélégraphie sur la fréquence de 500 kHz, il doit être immédiatement précédé par l'émission du signal d'alarme visé dans cet alinéa.

(7) Lorsque, dans tout cas autre qu'un cas de détresse, l'émission du signal d'alarme visé à l'alinéa (5)*a*) est permise par le règlement annexé à la Convention sur la sécurité et que ce signal a été émis, l'émission de tout avertissement ou message ne peut commencer avant que s'écoulent deux minutes depuis la fin du signal d'alarme.

(8) Les signaux d'alarme et de détresse visés au paragraphe (5) doivent être utilisés lorsqu'un navire est menacé par un grave et imminent danger et requiert une assistance immédiate.

(9) Le signal d'urgence visé au paragraphe (5) doit être utilisé lorsqu'un navire, autre qu'un navire visé au paragraphe (8), a besoin d'assistance ou qu'il y a lieu d'émettre un avertissement à l'effet que le navire peut émettre plus tard le signal d'alarme ou le signal de détresse.

(10) Lorsqu'une personne a émis un signal d'alarme ou de détresse depuis un navire et découvre subséquemment que le navire n'a plus besoin d'assistance, elle doit avertir immédiatement toutes les stations alertées que le navire n'a plus besoin d'assistance.

(11) Le capitaine d'un navire en mer qui rencontre dans une zone l'une ou l'autre des conditions suivantes:

a) glaces dangereuses, épaves dangereuses ou autres dangers à la navigation,

b) tempête tropicale ou vents d'une force de dix ou plus sur l'échelle de Beaufort et pour lesquels aucun avertissement de tempête n'a été reçu ou

SSTR-23

(*c*) subfreezing air temperature associated with gale force winds causing severe ice accretion on the superstructure of the ship,

shall forthwith inform all ships in the area and the appropriate coast radio station of the conditions by the quickest means available.

Time

60. (1) Subject to subsection (2), every person using a ship station on a ship operating within a VHF coverage area, an MF coverage area or an HF coverage area shall, when expressing and transmitting time, observe the local time of the area in which the ship is operating.

(2) Every person using a ship station on a ship

(*a*) operating on an international voyage beyond an HF coverage area shall, when expressing and transmitting time, observe Greenwich Mean Time; and

(*b*) operating in the Great Lakes and the St. Lawrence River above St. Lambert Lock shall, when expressing and transmitting time, observe Eastern Standard Time.

(3) Every person using a ship station shall, when expressing and transmitting time, use the 24 hour system and express and transmit time by means of four figures (0001 to 2400) followed by the appropriate time zone identifier.

Radiotelegraph Safety Watches and Operators

61. (1) Subject to subsections (2) and (6), on every ship fitted with an MF radiotelegraph ship station, there shall be maintained, while at sea, a continuous watch of 500 kHz in the following manner:

(*a*) on every ship not fitted with a radiotelegraph auto alarm, a listening watch shall be maintained at all times by a qualified operator using headphones or a loudspeaker; and

(*b*) on every ship fitted with a radiotelegraph auto alarm, the listening watch shall be maintained by a qualified operator using headphones or a loudspeaker as follows:

(i) in the case of a passenger ship carrying or certified to carry more than 250 passengers that is engaged on a voyage between two consecutive ports the duration of which is 16 hours or more, for 16 hours a day during the periods specified in column 1 of Schedule V for the zone in which the ship is located,

(ii) in the case of a passenger ship carrying or certified to carry more than 250 passengers that is engaged on a voyage between two consecutive ports the duration of which is less than 16 hours, for 8 hours a day during the periods specified in column 2 of Schedule V for the zone in which the ship is located, or

(iii) in the case of a passenger ship carrying or certified to carry 250 passengers or less and in the case of a cargo ship, for 8 hours a day during the periods specified in column 2 of Schedule V for the zone in which the ship is located.

LTSR-23

c) température inférieure au point de congélation associée à des coups de vent faisant que de la glace s'accumule sur la superstructure du navire,

doit immédiatement informer tous les navires de la zone et la station radio côtière appropriée des conditions par le moyen le plus rapidement disponible.

Heure

60. (1) Sous réserve du paragraphe (2), toute personne qui utilise la station d'un navire naviguant dans une des zones de couverture VHF, MF ou HF, doit, lorsqu'elle exprime et transmet l'heure, observer l'heure du lieu de la zone où le navire se trouve.

(2) Toute personne utilisant la station d'un navire

a) qui au cours d'un voyage international se trouve au-delà de la zone de couverture HF doit, lorsqu'elle exprime et transmet l'heure, observer l'heure de Greenwich et

b) qui navigue sur les Grands lacs et le fleuve Saint-Laurent, en amont de l'écluse de Saint-Lambert, doit, lorsqu'elle exprime et transmet l'heure, observer l'heure normale de l'Est.

(3) Toute personne qui utilise une station de navire doit, lorsqu'elle exprime et transmet l'heure, utiliser le système de 24 h et exprimer et transmettre l'heure au moyen de quatre chiffres (de 0001 à 2400) suivis de l'indicateur du fuseau horaire approprié.

Veilles radiotélégraphiques de sécurité et opérateurs

61. (1) Sous réserve des paragraphes (2) et (6), il faut maintenir sans interruption l'écoute sur 500 KHz à bord de tout navire en mer muni d'une station radiotélégraphique MF, de la façon suivante:

a) à bord de tout navire non muni d'un récepteur d'auto-alarme radiotélégraphique, une écoute doit être maintenue en tout temps par un opérateur qualifié utilisant un casque d'écoute ou un haut-parleur et

b) à bord de tout navire muni d'un récepteur d'auto-alarme radiotélégraphique, l'écoute doit être maintenue par un opérateur qualifié utilisant un casque d'écoute ou un haut-parleur, de la façon suivante:

(i) dans le cas d'un navire à passagers transportant ou autorisé à transporter plus de 250 passagers et qui effectue, entre deux ports consécutifs, un voyage d'une durée de 16 h ou plus, 16 h/d durant les périodes spécifiées dans la colonne 1 de l'annexe V pour la zone où le navire se trouve,

(ii) dans le cas d'un navire à passagers transportant ou autorisé à transporter plus de 250 passagers et qui effectue, entre deux ports consécutifs, un voyage d'une durée de moins de 16 h, 8 h/d durant les périodes spécifiées dans la colonne 2 de l'annexe V pour la zone où le navire se trouve,

(iii) dans le cas d'un navire à passagers transportant ou autorisé à transporter 250 passagers ou moins et dans le cas d'un navire de charge, 8 h/d durant les périodes

SSTR-24

(2) Subject to subsection (3), during the periods of watch by a qualified operator prescribed by this section, the operator may discontinue listening on 500 kHz if

(*a*) he is

(i) handling traffic on other frequencies, or

(ii) performing other essential radio duties; or

(*b*) it is impracticable to listen by means of split headphones or loudspeaker.

(3) The periods of watch referred to in subsection (2) shall be maintained during the silence periods prescribed by the International Radio Regulations.

(4) The radiotelegraph auto alarm referred to in subsection (1) shall comply with Schedule IV.

(5) The radiotelegraph auto alarm, where fitted on a ship, shall, during the period the ship is at sea, be in operation when the operator is not on watch or when listening on 500 kHz by the operator is discontinued as permitted under subsection (2).

(6) Where a ship is plying regularly on the rivers or along the coasts of Canada and in the opinion of the Chairman it is not practical for the owner of that ship to comply with the watches set out in Schedule V, the owner of the ship may keep special watches in lieu of those set out in Schedule V and, in such a case, a list of the special watches shall be posted in the ship station operating room of the ship.

RTSN-24

spécifiées dans la colonne 2 de l'annexe V pour la zone où le navire se trouve

(2) Sous réserve du paragraphe (3), l'opérateur qualifié peut interrompre l'écoute sur 500 kHz au cours des périodes d'écoute prescrites au présent article,

a) s'il

(i) s'occupe du trafic sur les autres fréquences ou

(ii) effectue d'autres fonctions essentielles en matière de radio, ou

b) s'il est impossible d'écouter au moyen d'un casque d'écoute ou d'un haut-parleur

(3) Les périodes d'écoute visées au paragraphe (2) doivent se continuer durant les périodes de silence prescrites par le Règlement international des radiocommunications

(4) Le récepteur d'auto-alarme radiotélégraphique visé au paragraphe (1) doit être conforme aux indications de l'annexe IV.

(5) Le récepteur d'auto-alarme radiotélégraphique, lorsqu'un navire en est muni, doit durant le séjour du navire en mer, être en fonctionnement lorsque l'opérateur n'est pas en service d'écoute ou lorsqu'il interrompt l'écoute sur 500 kHz comme le permet le paragraphe (2).

(6) Lorsqu'un navire fait régulièrement la navette sur les rivières, ou le long du littoral du Canada et que, de l'avis du président, il est impossible au propriétaire du navire d'observer les écoutes visées à l'annexe V, le propriétaire du navire peut tenir des écoutes spéciales au lieu de celles visées à l'annexe V et, dans un tel cas, la liste des écoutes spéciales doit être affichée dans la salle de la station du navire.

SSTR-24A

NTSN-24A

Radiotelephone Safety Watches and Operators

"62 (1) Subject to subsection (2), where a ship is fitted with radiotelephone installations pursuant to the *Ship Station Radio Regulations* is at sea, a continuous listening watch at the main operating positions of such installations shall be maintained on the following frequencies

(*a*) in the case of an MF radiotelephone installation, on the distress and calling frequency of 2182 kHz, and

(*b*) in the case of a combined MF/HF radiotelephone installation, while the ship is within the HF coverage area north of the limits of the MF coverage areas, on the 4 MHz channel designated for public correspondence in the HF coverage area, as specified in the Canadian Coast Guard Publication *Radio Aids to Marine Navigation* referred to in Schedule III

(2) The continuous listening watch required by subsection (1) may be discontinued during any period when a radiotelephone installation referred to in that subsection is being used to transmit or receive on other working frequencies except that the watch required by paragraph (1)(*a*) shall not be discontinued during the silence periods prescribed by the *International Radio Regulations*" SOR/80-181

(3) The continuous listening watch required by subsection (1) shall be maintained by a person designated by the master

(4) A person designated pursuant to subsection (3) may simultaneously perform other duties assigned to him by the master if they do not interfere with the effectiveness of the listening watch

"(5) Every ship required, pursuant to subsection 4(1.1) of the *Ship Station Radio Regulations* to be fitted with a radiotelephone distress frequency watch receiver shall while at sea, in addition to the continuous listening watch required by subsection (1), maintain a continuous listening watch on the radiotelephone distress frequency 2182 kHz in the place on board from which the ship is normally navigated, by use of the radiotelephone distress frequency watch receiver using a loudspeaker, a filtered loudspeaker or a radiotelephone auto alarm." SOR/81-441

63 On every ship fitted with a VHF radiotelephone installation, there shall be maintained a continuous listening watch in accordance with section 8 of the VHF Radiotelephone Practices and Procedures Regulations

Veilles radiotéléphoniques de sécurité et opérateurs

«62 (1) Sous réserve du paragraphe (2), un navire muni d'installations radiotéléphoniques conformément au *Règlement sur les stations radio de navires* doit, lorsqu'il est en mer, assurer une écoute permanente aux postes de travail principaux de ces installations, aux fréquences suivantes:

a) dans le cas d'une installation radiotéléphonique MF, à la fréquence de détresse et d'appel, soit 2182 kHz; et

b) dans le cas d'une installation radiotéléphonique combinée MF/HF, lorsque le navire est dans la zone de couverture HF au nord des limites des zones de couverture MF, sur la voie 4 MHz, réservée à la correspondance publique dans la zone de couverture HF, comme l'indique la publication *Aides radio à la navigation maritime de la Garde côtière canadienne* visée à l'annexe III

(2) L'écoute visée au paragraphe (1) peut être interrompue pendant qu'une installation radiotéléphonique visée à ce paragraphe sert à l'émission ou à la réception de signaux sur d'autres fréquences de travail, toutefois, l'écoute requise à l'alinéa (1)*a*) ne peut être interrompue durant les périodes de silence prescrites par le *Règlement international des radiocommunications*» DORS/80-181

(3) L'écoute visée au paragraphe (1) doit être maintenue par une personne désignée par le capitaine

(4) La personne désignée conformément au paragraphe (3) peut simultanément remplir les autres fonctions qui lui sont assignées par le capitaine si cela ne nuit pas à l'efficacité de l'écoute

«(5) A bord de tout navire que le paragraphe 4(1.1) du *Règlement sur les stations radio de navires* requiert de munir d'un récepteur de veille sur la fréquence radiotéléphonique de détresse, il faut, pendant qu'il se trouve en mer, outre l'écoute permanente prescrite au paragraphe (1), assurer une écoute permanente sur la fréquence radiotéléphonique de détresse (2182 kHz) au poste d'où le navire est normalement dirigé, au moyen du récepteur de veille sur la fréquence radiotéléphonique de détresse, en utilisant un haut-parleur, un haut-parleur filtré ou une auto-alarme radiotéléphonique» DORS/81-441

63 A bord de tout navire muni d'une installation radiotéléphonique VHF, une écoute doit être maintenue sans interruption conformément à l'article 8 du Règlement sur les pratiques et les règles de radiotéléphonie VHF.

SSTR-25

Position Reporting

"6- (1) Subject to subsection (2), the master of every ship engaged in an offshore voyage of more than 24 hours duration during which the ship will proceed

(*a*) beyond the VHF coverage areas and the MF coverage areas,

(*b*) outside a shipping safety control zone prescribed pursuant to subsection 11(1) of the *Arctic Waters Pollution Prevention Act*, or

(*c*) outside the waters of

(i) Hudson Bay,

(ii) Ungava Bay, or

(iii) James Bay,

shall, during the course of the voyage, make reports to AMVER in accordance with the procedure set out in the current issue of the Canadian Coast Guard [illegible] Radio Aids to Marine Navigation."

SOR/79-375

(2) Subsection (1) does not apply to

(*a*) [illegible]

(*b*) a ship [illegible] right of Canada that is [illegible]

(3) An entry concerning the [illegible] section (1) shall be recorded in the radio log referred to [illegible] 66(1).

[illegible]

65. (1) Every MF radiotelegraph installation shall be operated by an operator, holding a First or Second Class Radiotelegraph Operator's Certificate or a Radiocommunication Operator's General Certificate for the Maritime Mobile Service.

(2) Subject to subsection (3), every MF, combined MF/HF [illegible] MF radiotelephone installation shall be operated [illegible] subsection (1) or by a person holding [illegible] Operator's Certificate.

(3) The holder of a Restricted Radiotelephone Operator's Certificate may operate [illegible] telephone installation referred to in subsection (2) if

(*a*) the operation of the transmitter requires only the use of simple external switching devices, requiring all manual adjustment of frequency determining elements; and

(*b*) the peak envelope power of the transmitter does not exceed 1.5 kilowatts.

(4) Every ship fitted with an MF, combined MF/HF or [illegible] telephone installation shall have at least two qualified operators on board where more than one [illegible] has been established for that ship.

(5) Every ship fitted with a MF [illegible]

SOR/79-375

SPSN-25

Compte rendu de position

«64. (1) Sous réserve du paragraphe (2), le capitaine d'un navire effectuant une traversée de plus de 24 heures au cours de laquelle le navire opère

a) au-delà des zones de couverture VHF et MF,

b) à l'extérieur d'une zone de contrôle de sécurité de la navigation prescrite en vertu du paragraphe 11(1) de la *Loi sur la prévention de la pollution des eaux arctiques*, ou

c) à l'extérieur des eaux

(i) de la baie d'Hudson,

(ii) de la baie d'Ungava, ou

(iii) de la baie James,

doit, au cours de la traversée, faire [illegible] comptes rendus au AMVER, conformément à la [illegible] courante des Aides radio à la navigation [illegible] par la Garde côtière canadienne, ministère des [illegible]

DORS/79-375

(2) Le paragraphe (1) ne s'applique pas

a) [illegible] de pêche, ni

b) à un navire appartenant à Sa Majesté du chef du Canada [illegible] exploité en son nom, engagé dans la surveillance [illegible]

(3) Le compte rendu visé au paragraphe (1) doit faire l'objet [illegible] inscription dans le journal de bord radio [illegible] 66(1).

Opérateurs qualifiés

65. (1) Les installations radiotélégraphiques MF doivent être exploitées par un opérateur titulaire d'un [illegible] radiotélégraphiste de 1re ou de 2e classe ou d'un certificat [illegible]

(2) Sous réserve du paragraphe (3), l'utilisation de toute installation radiotéléphonique MF, de toute installation radiotéléphonique combinée MF/HF et de toute installation radiotéléphonique VHF doit être confiée à une personne décrite au paragraphe (1) ou au titulaire d'un certificat général de [illegible]

(3) Le titulaire d'un certificat restreint de radiotéléphoniste peut utiliser une [illegible] installations radiotéléphoniques visées au paragraphe (2) si,

a) pour faire fonctionner l'émetteur, il suffit d'utiliser des interrupteurs ou commutateurs extérieurs simples excluant tout réglage manuel des éléments qui déterminent la fréquence et

b) la puissance de crête de l'émetteur ne dépasse pas 1,5 kW.

(4) Tout navire muni [illegible] des installations visées au paragraphe (2) doit [illegible] deux opérateurs qualifiés à bord lorsque le [illegible] plus d'un quart à la passerelle.

SSTF-26

(a) in the case of a ship described in paragraph 61(1)(a) or subparagraph 61(1)(b)(i), have at least two qualified operators on board, and

(b) in the case of a ship described in subparagraph 61(1)(b)(ii) or (iii), have at least one qualified operator on board.

(6) The operators referred to in this section shall be at least 18 years of age.

RTSN-26

a) dans le cas d'un navire visé à l'alinéa 61(1)a) ou au sous-alinéa 61(1)b)(i), avoir au moins deux opérateurs qualifiés à bord et,

b) dans le cas d'un navire décrit aux sous-alinéas 61(1)b)(ii) ou (iii), avoir au moins un opérateur qualifié à bord.

(6) Les opérateurs visés par le présent article doivent avoir 18 ans révolus.

PART III

LOG BOOKS

General

"66 (1) A radio log, in the form of the Official Radio Log referred to in Schedule III, shall be provided for each ship station on a ship." SOR/79-575

(2) The radio log referred to in subsection (1) shall

(a) be located at the main operating position of the ship station during the period the ship is at sea,

(b) be kept by the operator maintaining the listening watch required by these Regulations,

"(c) contain entries recording the following:

(i) the name, official registration number, port of registry, gross tonnage of the ship, and the radio call sign,

(ii) the period covered by the log,

(iii) the time in which the log is maintained as required by section 60, and

(iv) particulars of radio batteries on board."

SOR/79-575

(3) The radio log in its original form shall be retained

(a) on board the ship for a period of not less than one month from the date of the last entry, and

(b) in a place where it is available for inspection by a radio inspector for a period additional to the period referred to in paragraph (a) of not less than eleven months.

"Radio Log for Radiotelegraph Stations

67. (1) On a ship fitted with a radiotelegraph ship station, the operator on watch shall keep a radio log and, in addition to the particulars required by paragraph 66(2)(c), shall enter therein

(a) his name;

(b) the time he commenced his watch;

(c) details of the following service incidents, together with the time of occurrence and the radio frequencies in use, namely,

(i) every communication relating to distress traffic, in full,

(ii) every urgency and safety communication,

(iii) every silence period during the periods of listening watch prescribed by these Regulations,

(iv) every communication between the ship station of the ship and any other radio station, and

(v) any other service incident;

PARTIE III

JOURNAUX DE BORD RADIO

Dispositions générales

«66 (1) Un journal de bord radio du genre visé à l'annexe III doit être prévu pour chaque station à bord d'un navire.»

DORS/79-575

(2) Le journal de bord radio doit

a) être placé au poste de travail principal de la station du navire durant le séjour du navire en mer,

b) être tenu par l'opérateur assurant l'écoute qu'exige le présent règlement,

«c) contenir les inscriptions suivantes:

(i) le nom, le numéro officiel d'immatriculation, le port d'immatriculation, la jauge brute du navire et l'indicatif d'appel radio,

(ii) la période visée par le journal de bord,

(iii) l'heure utilisée pour la tenue du journal de bord, tel que l'exige l'article 60, et

(iv) les détails concernant les batteries radio à bord.»

DORS/79-575

(3) Le journal de bord radio doit être gardé dans sa forme originale

a) à bord du navire durant au moins un mois à compter de la date de la dernière inscription et

b) en un endroit où il peut être inspecté par un inspecteur de radio au cours d'une période d'au moins onze mois en plus de la période visée à l'alinéa a).

«Journal de bord des stations radiotélégraphiques

67 (1) L'opérateur à l'écoute à bord d'un navire muni d'une station radiotélégraphique doit tenir un journal de bord radio et, outre les renseignements exigés par l'alinéa 66(2)c), y consigner ce qui suit.

a) son nom;

b) l'heure à laquelle il a pris l'écoute;

c) le détail des incidents de service énumérés ci-après, ainsi que l'heure à laquelle ils se sont produits et les fréquences radio utilisées, soit

(i) une description complète de toutes les communications relatives au trafic de détresse,

(ii) tous les messages d'urgence et de sécurité,

(iii) toutes les périodes de silence au cours des périodes d'écoute prescrites par le présent règlement,

(iv) toutes les communications entre la station du navire et toute autre station radio, et

(v) tout autre incident de service;

SSTR-27

(*d*) the position of the ship indicated in each AMVER report transmitted while the ship was at sea and the time at which it was so positioned; and

(*e*) a notation, every period of 15 minutes, to indicate he has been maintaining a listening watch, where no other entry respecting a radio communication has been entered in the radio log during that period.

(2) On a ship referred to in subsection (1), the operator on watch shall enter in the radio log details of the following routine maintenance procedures:

(*a*) daily maintenance and charging of any storage batteries forming part of the main radiotelegraph installation or reserve radiotelegraph installation;

(*b*) daily tests of the reserve radiotelegraph installation, the radiotelegraph alarm signal keying device and the radiotelegraph auto alarm;

(*c*) daily tests of the source of electrical energy for the reserve radiotelegraph installation;

(*d*) weekly maintenance and charging of all storage batteries forming part of any motor lifeboat radiotelegraph installation or portable radio apparatus required on board the ship pursuant to the *Lifesaving Equipment Regulations*; and

(*e*) weekly tests of motor lifeboat radiotelegraph installations and portable radio apparatus.

Radio Log for Radiotelephone Stations

68. (1) Subject to subsection (2), on a ship fitted with a radiotelephone ship station, the operator on watch shall keep a radio log and, in addition to the particulars required by paragraph 66(2)(*c*), shall enter therein

(*a*) his name;

(*b*) the time he commenced his watch;

(*c*) brief details of the following service incidents, together with the time of occurrence and the radio frequencies in use, namely,

(i) every communication relating to distress traffic,

(ii) every urgency and safety communication,

(iii) every communication between the ship station of the ship and any other radio station, and

(iv) any other service incident;

(*d*) a statement setting out the time of and reason for any discontinuance of the listening watch required by subsection 62(1); and

(*e*) the position of the ship indicated in each AMVER report transmitted while the ship was at sea and the time at which it was so positioned.

RTSN-27

d) la position du navire indiquée dans chaque rapport transmis au AMVER pendant que le navire était en mer, ainsi que l'heure à laquelle il occupait cette position; et

e) une inscription tous les quarts d'heure pour indiquer qu'il est resté à l'écoute radio lorsqu'aucune inscription de radiocommunication n'a été reportée au journal de bord radio pendant la période en question.

(2) L'opérateur à l'écoute à bord du navire visé au paragraphe (1) doit inscrire dans le journal de bord radio les détails suivants sur l'entretien courant:

a) l'entretien quotidien et la charge des accumulateurs alimentant l'installation radiotélégraphique principale ou l'installation radiotélégraphique de réserve;

b) les essais quotidiens de l'installation radiotélégraphique de réserve, du manipulateur du signal d'alarme radiotélégraphique et du récepteur d'auto-alarme radiotélégraphique;

c) les essais quotidiens de la source d'énergie électrique alimentant l'installation radiotélégraphique de réserve;

d) l'entretien hebdomadaire et la charge des accumulateurs alimentant les instalations radiotélégraphiques des embarcations de sauvetage à moteur ou les appareils radio portatifs que le *Règlement sur l'équipement de sauvetage* exige à bord du navire; et

e) les essais hebdomadaires des installations radiotélégraphiques des embarcations de sauvetage à moteur et de tout appareil radio portatif.

Journal de bord des stations radiotéléphoniques

68. (1) Sous réserve du paragraphe (2), l'opérateur à l'écoute à bord d'un navire muni d'une station radiotéléphonique doit tenir un journal de bord radio et, outre les renseignements prescrits par l'alinéa 66(2)*c*), y consigner ce qui suit:

a) son nom;

b) l'heure à laquelle il a pris l'écoute;

c) une brève description des incidents de service énumérés ci-après, ainsi que l'heure à laquelle ils se sont produits et les fréquences radio utilisées, soit

(i) toutes les communications relatives au trafic de détresse,

(ii) tous les messages d'urgence et de sécurité,

(iii) toutes les communications entre la station du navire et toute autre station radio, et

(iv) tout autre incident de service;

d) l'indication de l'heure et de la raison de toute interruption des périodes d'écoute, tel que l'exige le paragraphe 62(1); et

e) la position du navire indiquée dans chaque rapport transmis au AMVER pendant que le navire était en mer et l'heure à laquelle il occupait cette position.

SSTR-28

(2) Where a ship described in subsection (1) is under 300 gross tons and is operating exclusively on home-trade, class IV voyages, the operator on watch need comply with paragraph (1)(c) only to the extent practicable under the working conditions on board that ship.

(3) The operator on watch referred to in subsection (1) shall enter in the radio log details of the following routine maintenance procedures

(a) daily maintenance and charging of any storage batteries that supply only the radiotelephone installation;

(b) daily tests of fitted radiotelephones not in normal daily use;

(c) daily tests of the radiotelephone alarm signal device;

(d) weekly tests of portable apparatus for survival craft; and

(e) weekly maintenance and charging of any storage batteries that supply the reserve source of energy described in subsection 41(5)." SOR/79-575

RTSN-28

(2) Lorsqu'un navire visé au paragraphe (1) jauge moins de 300 tonneaux et n'effectue que des voyages de cabotage, classe IV, l'opérateur à l'écoute ne doit se conformer aux dispositions de l'alinéa (1)c) que dans la mesure où les conditions de travail du navire le lui permettent.

(3) L'opérateur à l'écoute visé au paragraphe (1) doit consigner au journal de bord radio les détails suivants sur l'entretien courant:

a) l'entretien quotidien et la charge des accumulateurs alimentant uniquement l'installation radiotéléphonique;

b) les essais quotidiens des radiotéléphones installés à bord du navire mais non utilisés quotidiennement;

c) les essais quotidiens du dispositif du signal d'alarme radiotéléphonique;

d) les essais hebdomadaires des appareils radio portatifs des embarcations de sauvetage; et

e) l'entretien hebdomadaire et la charge des accumulateurs alimentant la source d'électricité de réserve décrite au paragraphe 41(5).» DORS/79-575

PART IV

INSPECTION AND CERTIFICATES OF SHIP STATIONS

69. Any radio inspector authorized by the Minister to do so may enter any ship for the purpose of inspecting any ship station fitted on the ship and may inspect any apparatus fixed or in use in such ship station and all books and papers used in connection with the operation of the ship station.

70. (1) The master of every Canadian ship, other than a ship engaged on an international voyage, shall ensure that the ship station fitted on the ship is inspected by a radio inspector authorized by the Minister to do so within thirty days

(a) prior to the ship proceeding to sea for the first time, or

(b) prior to the ship proceeding to sea after having been out of service for more than thirty days,

and at least once every twelve months thereafter during the period the ship is in service.

(2) The master of every non-Canadian ship shall, before entering the St. Lawrence Seaway, ensure that the ship station fitted on the ship is inspected by a radio inspector authorized by the Minister to do so.

PARTIE IV

INSPECTION ET CERTIFICATS DES STATIONS DE NAVIRE

69. Tout inspecteur de radio autorisé par le ministre peut monter à bord d'un navire pour y inspecter toute station installée à bord et tout appareil fixe ou utilisé dans la station du navire et tous les livres et documents utilisés au sujet du fonctionnement de la station du navire.

70. (1) Le capitaine de tout navire canadien, autre qu'un navire effectuant un voyage international, doit s'assurer qu'un inspecteur de radio autorisé par le ministre inspecte la station installée à bord du navire dans les trente jours

a) précédant le premier appareillage, ou

b) précédant un appareillage après une cessation de service de plus de trente jours,

et au moins une fois à tous les douze mois par la suite pendant la période de service du navire.

(2) Le capitaine de tout navire non canadien doit, avant d'entrer dans la voie maritime du Saint-Laurent, s'assurer de faire inspecter la station installée à bord du navire par un inspecteur de radio autorisé par le ministre.

SOR-29

"(3) Where a radio inspector inspects a ship station fitted on a ship pursuant to subsection (1) or (2) and he is satisfied that the ship station complies with the *Ship Station Radio Regulations* and these Regulations, a Radio Inspection Certificate shall be issued by the inspector and any equivalents that have been granted under section 8 of the *Ship Station Radio Regulations* or section 4.1 of these Regulations shall be noted as an endorsement of the certificate."

SOR/79-575

(4) A Radio Inspection Certificate referred to in subsection (3) shall be valid for a period not exceeding one year from the date of issue and shall be posted in a prominent and accessible place on board the ship.

RTSX-29

«(3) Lorsqu'un inspecteur de radio a fait l'inspection d'une station de navire selon les paragraphes (1) ou (2) et est convaincu que la station est conforme au *Règlement sur les stations radio de navires* et au présent règlement, il délivre un certificat d'inspection de radio, et toute équivalence accordée en vertu de l'article 8 du *Règlement sur les stations radio de navires* ou de l'article 4.1 du présent règlement, fait l'objet d'une mention sur le certificat.»

DORS/79-575

(4) Tout certificat d'inspection de radio visé au paragraphe (3) est valide pour un an au plus à compter de la date de délivrance et doit être affiché dans un endroit bien en vue et d'accès facile à bord du navire.

SSTF-30 RTSN-30

SCHEDULE I
OFFICIAL RADIO LOG
FOR SHIP STATIONS
(Radiotelegraph)

Revoked SOR/79-575

SSTR-31 RTSN-31

ANNEXE I

JOURNAL DE BORD RADIO OFFICIEL

POUR LES STATIONS DE NAVIRE

(Radiotélégraphie)

Abrogée DORS/79-575

SSTR-32

SCHEDULE II
OFFICIAL RADIO LOG
FOR SHIP STATIONS
(Radiotelephone)

Revoked SOR/79-575

RTSN-32

ANNEXE II
JOURNAL DE BORD RADIO OFFICIEL
POUR LES STATIONS DE NAVIRE
(Radiotélephonie)

Abrogée DORS/79-575

SSTR-33

SCHEDULE III

PUBLICATIONS

1. Ships required to be fitted with an MF radiotelegraph installation shall carry the following:
   (*a*) Ships Station Licence;
   (*b*) Radio Operator's Certificates;
   (*c*) Official Radio Log[2];
   (*d*) Alphabetical List of Call Signs of Stations Used in the Maritime Mobile Service[1];
   (*e*) List of Coast Stations[1];
   (*f*) List of Ship Stations[1];
   (*g*) List of Radiodetermination and Special Service Stations[1];
   (*h*) ITU Manual for use by the Maritime Mobile and Maritime Mobile Satellite Service[1];
   (*i*) Current applicable edition of Radio Aids to Marine Navigation[2];
   (*j*) The *Ship Station Radio Regulations* and the *Ship Station Technical Regulations* made under the *Canada Shipping Act*[2];
   (*k*) Manufacturer's Operating and Maintenance Manuals for the Radio Equipment in Use;
   (*l*) Current bi-monthly AMVER bulletin[3].
2. Ships required to be fitted with a radiotelephone installation operating outside the VHF coverage area and MF coverage area shall carry the following:
   (*a*) Ship Station Licence;
   (*b*) Radio Operator's Certificates;
   (*c*) Official Radio Log[2];
   (*d*) List of Coast Stations[1];
   (*e*) Current applicable edition of Radio Aids to Marine Navigation[2];
   (*f*) ITU Manual for use by the Maritime Mobile and Maritime Mobile Satellite Service[1];
   (*g*) The *Ship Station Radio Regulations* and the *Ship Station Technical Regulations* made under the *Canada Shipping Act*[2];
   (*h*) Manufacturer's Operating and Maintenance Manuals for the Radio Equipment in Use;
   (*i*) Current bi-monthly AMVER buletin[3].
3. Ships required to be fitted with a radiotelephone installation operating within VHF coverage area and MF coverage area shall carry the following:
   (*a*) Ship Station Licence;
   (*b*) Radio Operator's Certificates;
   (*c*) Official Radio Log[2];
   (*d*) Current applicable edition of Radio Aids to Marine Navigation[2];

RTSN-33

ANNEXE III

PUBLICATIONS

1. Les navires tenus d'être munis d'une installation radiotélégraphique MF doivent avoir à bord
   a) une licence de station de navire,
   b) les certificats des opérateurs radio,
   c) le journal de bord radio officiel[2],
   d) la liste alphabétique des indicatifs d'appel des stations utilisées dans le Service mobile maritime[1],
   e) la nomenclature des stations côtières[1],
   f) la nomenclature des stations de navire[1],
   g) la nomenclature des stations de radiorepérage et des stations effectuant des services spéciaux[1],
   h) le manuel de l'UIT à l'intention du Service mobile maritime et du Service mobile maritime par satellites[1],
   i) un exemplaire applicable de la dernière édition des Aides radio à la navigation maritime[2],
   j) le *Règlement sur les stations radio de navires* et le *Règlement technique sur les stations (radio) de navires* établis selon la *Loi sur la marine marchande du Canada*[2],
   k) les manuels d'emploi et d'entretien du fabricant du matériel radio utilisé,
   l) le plus récent bulletin bimestriel AMVER[3].
2. Les navires tenus d'être munis d'une installation radiotéléphonique pour utilisation à l'extérieur des zones de couverture VHF et MF doivent avoir à bord
   a) une licence de station de navire,
   b) les certificats des opérateurs radio,
   c) le journal de bord radio officiel[2],
   d) la nomenclature des stations côtières[1],
   e) un exemplaire applicable de la dernière édition des Aides radio à la navigation maritime[2],
   f) le manuel de l'UIT à l'intention du Service mobile maritime et du Service mobile maritime par satellites[1],
   g) le *Règlement sur les stations radio de navires* et le *Règlement technique sur les stations (radio) de navires* établis selon la *Loi sur la marine marchande du Canada*[2],
   h) les manuels d'emploi et d'entretien du fabricant du matériel radio utilisé,
   i) le plus récent bulletin bimestriel AMVER[3].
3. Les navires tenus d'être munis d'une installation radiotéléphonique pour utilisation à l'intérieur des zones de couverture VHF et MF doivent avoir
   a) une licence de station de navire,
   b) les certificats des opérateurs radio,
   c) le journal de bord radio officiel[2],
   d) un exemplaire applicable de la dernière édition des Aides radio à la navigation maritime[2],

SSTR-34

(e) The *Ship Station Radio Regulations* and the *Ship Station Technical Regulations* made under the *Canada Shipping Act*[2];

(f) Manufacturer's Operating and Maintenance Manuals for the Radio Equipment in Use.

1. Available from the International Telecommunication Union, Geneva.
2. Available from the Department of Supply and Services, Ottawa.
3. Available free of charge from the Department of Transportation, U.S. Coast Guard, Governors Island, New York, N.Y. 10004.

SCHEDULE IV

RADIOTELEGRAPH AUTO ALARM REQUIREMENTS

1. Every radiotelegraph auto alarm intended for the reception of the radiotelegraph alarm signal shall meet the following requirements:

(a) in the absence of interference of any kind, the radiotelegraph auto alarm shall be capable of being actuated, without manual adjustment, by any radiotelegraph alarm signal that is transmitted on the frequency of 500 kHz by any coast station, ship station or ship's emergency or survival craft transmitter operating in accordance with the International Radio Regulations, in any case where the strength of the signals at the receiver input is greater than 100 microvolts and less than one volt;

(b) in the absence of interference of any kind, the radiotelegraph auto alarm shall be actuated by either three or four consecutive dashes when the dashes vary in length from 3.5 to as near 6 seconds as possible and the spaces vary in length between 1.5 seconds and the lowest practicable value, but where possible not greater than 10 milliseconds,

(c) the radiotelegraph auto alarm shall not be actuated by atmospherics or by any signal, other than the radiotelegraph alarm signal or a signal falling within the tolerance limits prescribed in paragraph (*b*);

(d) the selectivity of the radiotelegraph auto alarm shall be such as

(i) to provide a practically uniform sensitivity over a band extending not less than 4 kHz and not more than 8 kHz on each side of the radiotelegraph distress frequency, and

(ii) to provide, outside that band, a sensitivity that decreases as rapidly as possible in conformity with the best engineering practice;

RTSN-34

e) le *Règlement sur les stations radio de navires* et le *Règlement technique sur les stations radio de navires* établis selon la *Loi sur la marine marchande du Canada*[2];

f) les manuels d'emploi et d'entretien du fabricant du matériel radio utilisé.

1. Peut être obtenu de l'Union internationale des télécommunications, Genève.
2. Peut être obtenu du ministère des Approvisionnements et Services, Ottawa.
3. Peut être obtenu gratuitement du Department of Transportation, U.S. Coast Guard, Governors Island, New York, N.Y. 10004

ANNEXE IV

EXIGENCES RELATIVES AUX RÉCEPTEURS D'AUTO-ALARMES RADIOTÉLÉGRAPHIQUES

1. Un récepteur d'auto-alarme radiotélégraphique destiné à la réception du signal d'alarme radiotélégraphique doit satisfaire aux conditions suivantes

a) en l'absence de brouillage de toute nature, le récepteur d'auto-alarme radiotélégraphique doit pouvoir être mis en action, sans réglage manuel, par tout signal d'alarme radiotélégraphique transmis sur la fréquence de 500 kHz par toute station côtière, toute station de navire, tout émetteur de secours de navire ou d'engin de sauvetage fonctionnant conformément au Règlement international des radiocommunications dans tous les cas où la tension du signal à l'entrée du recepteur est supérieure à 100 μV et inférieure à 1 V,

b) en l'absence de brouillage de toute nature, le récepteur d'auto-alarme radiotélégraphique doit être actionné par trois ou quatre traits consécutifs, la durée des traits étant comprise entre 3,5 s et une valeur aussi proche que possible de 6 s et celle des invervalles étant comprises entre 1,5 s et la plus petite valeur possible ne dépassant pas de préférence 10 ms,

c) le récepteur d'auto-alarme radiotélégraphique ne peut être mis en action par des parasites atmosphériques ou par tout signal, autre que le signal d'alarme radiotélégraphique ou un signal qui constitue en fait un signal tombant dans les limites de tolérance indiquées à l'alinéa *b*),

d) la sélectivité du récepteur d'auto-alarme radiotélégraphique doit être telle

(i) qu'elle procure une sensibilité presque uniforme dans une bande au moins égale à 4 kHz mais ne dépassant pas 8 kHz de part et d'autre de la fréquence radiotélégraphique de détresse et

(ii) que, en dehors de cette bande, elle procure une sensibilité décroissant aussi rapidement que possible, conformément aux meilleures règles de la technique.

(*e*) if practicable, the radiotelegraph auto alarm shall, in the presence of atmospherics or interfering signals, automatically adjust itself so that within a reasonably short time it approaches the condition in which it can most readily distinguish the radiotelegraph alarm signal;

(*f*) for the purpose of regularly testing the radiotelegraph auto alarm, the alarm apparatus shall include a generator pre-tuned to the radiotelegraph distress frequency and a keying device by means of which a radiotelegraph auto alarm signal of the minimum strength indicated in paragraph (*a*) is produced and a means shall also be provided for attaching headphones for the purpose of listening to signals received on the radiotelegraph auto alarm; and

(*g*) the radiotelegraph auto alarm shall be capable of withstanding vibration, humidity and changes of temperature, equivalent to severe conditions experienced on board ships at sea, and shall continue to operate under such conditions.

e) si cela est possible en pratique, le récepteur d'auto-alarme radiotélégraphique, en présence de bruits atmosphériques ou de brouillage, doit automatiquement se régler pour que, dans un délai raisonnablement court, il se rapproche des conditions dans lesquelles il pourra le plus facilement distinguer le signal d'alarme radiotélégraphique,

f) aux fins de vérifier périodiquement le fonctionnement du récepteur d'auto-alarme radiotélégraphique, l'appareil doit comprendre un générateur préaccordé sur la fréquence radiotélégraphique de détresse et un dispositif de manipulation permettant de produire un signal d'auto-alarme radiotélégraphique de tension égale au minimum indiqué à l'alinéa *a*). Il faut également prévoir le branchement d'un casque pour l'écoute des signaux reçus par le récepteur d'auto-alarme radiotélégraphique et

g) le récepteur d'auto-alarme radiotélégraphique doit pouvoir supporter des conditions de vibration et d'humidité et des variations de température correspondant aux conditions rigoureuses qui règnent à bord des navires en mer, et doit continuer à fonctionner dans de telles conditions.

SCHEDULE V

PERIODS OF WATCH TO BE MAINTAINED BY RADIOTELEGRAPH OPERATORS

Hours of Service

in

Ship's Time or Zone Time

Column 1			Column 2		
From		To	From		To
0000	—	0400	0800	—	1200
0800	—	1200	1800	—	2200 (Note 1)
1600	—	1800	Plus 2 hours		(Note 3)
2000	—	2200			
Plus 4 hours		(Note 2)			

NOTE 1—Two continuous hours of service between 1800-2200 hours, ship's time or zone time, at times decided by the master or responsible person.

NOTE 2—In addition to the hours shown, four hours of service at times to be decided by the master or responsible person, to meet the essential communication needs of the ship.

NOTE 3—In addition to the hours shown, two hours of service at times to be decided by the master or responsible person to meet the essential communication needs of the ship.

ANNEXE V

PÉRIODES D'ÉCOUTE DEVANT ÊTRE MAINTENUES PAR DES RADIOTÉLÉGRAPHISTES

Heures de service

dans

Heure locale ou heure du fuseau

Colonne 1			Colonne 2		
De		A	De		A
0000	—	0400	0800	—	1200
0800	—	1200	1800	—	2200 (Remarque 1)
1600	—	1800	Plus 2 h		(Remarque 3)
2000	—	2200			
Plus 4 h		(Remarque 2)			

REMARQUE 1—Deux heures ininterrompues de service entre 1800-2200 h, heure locale ou heure du fuseau, en tout temps, selon la décision du capitaine ou de la personne responsable.

REMARQUE 2—En plus des heures indiquées, quatre heures de service, aux heures déterminées par le capitaine ou la personne responsable, afin de répondre aux besoins essentiels de communication du navire.

REMARQUE 3—En plus des heures indiquées, deux heures de service, aux heures déterminées par le capitaine ou la personne responsable, afin de répondre aux besoins essentiels de communication du navire.

Government of Canada
Department of Communications

Telecommunications
Regulatory Service

Gouvernement du Canada
Ministère des Communications

Service de la réglementation des
télécommunications

RIM-1-1

THIRD EDITION

TROISIÈME ÉDITION

SSRR

SHIP STATION RADIO REGULATIONS

ESTABLISHED BY:

SOR / 78 - 219

AMENDED BY:

SOR / 78 - 529
SOR / 78 - 756
SOR / 81 - 316

NOTE

All persons making use of this consolidation are reminded that it has no Parliamentary sanction, that the amendments have been embodied only for convenience of reference, and that the original act and amendments thereto should be consulted for all purposes of interpreting and applying the law.

RSRN

RÈGLEMENT SUR LES STATIONS RADIO DE NAVIRE

ÉTABLI PAR

DORS / 78 - 219

MODIFIÉ PAR:

DORS / 78 - 529
DORS / 78 - 756
DORS / 81 - 316

REMARQUE

On rappelle aux lecteurs que la présente codification n'a aucune sanction Parlementaire, que les modifications y ont été incorporées aux seules fins d'en faciliter la consultation. Lorsqu'il s'agit d'interpréter et d'appliquer la loi, c'est à la loi et aux modifications mêmes qu'il faut se reporter.

SSRR-3

Registration
SOR/78-219 3 March, 1978

CANADA SHIPPING ACT
ARCTIC WATERS POLLUTION PREVENTION ACT

Ship Station Radio Regulations

P.C. 1978-626 2 March, 1978

His Excellency the Governor General in Council, on the recommendation of the Minister of Transport, is pleased hereby:

(*a*) to revoke, pursuant to sections 403 and 730 of the Canada Shipping Act, the Ship Station Radio Regulations, Part I made by Order in Council P.C. 1965-1175 of 23rd June, 1965[1], as amended[2], and the Ship Station Radio Regulations, Part III made by Order in Council P.C. 1956-192 of 2nd February, 1956[3], as amended[4], and

(*b*) to make, pursuant to sections 403 and 730 of the Canada Shipping Act and section 12 of the Arctic Waters Pollution Prevention Act, the annexed Regulations prescribing the radio stations to be fitted on ships,

effective June 1, 1978.

REGULATIONS PRESCRIBING THE RADIO STATIONS TO BE FITTED ON SHIPS

Short Title

1. These Regulations may be cited as the *Ship Station Radio Regulations*.

Interpretation

2. In these Regulations,

"Arctic Class ship" has the same meaning as in the *Arctic Shipping Pollution Prevention Regulations*; (*navires de côte arctique*)

"Chairman" means the Chairman of the Board of Steamship Inspection;

"home-trade voyage, class IV" has the meaning assigned to that expression by section 4 of the *Home-Trade, Inland and Minor Waters Voyages Regulations*; (*voyages de cabotage, classe IV*)

"HF coverage area" means all waters, except the waters of the VHF coverage area and the MF coverage area, that are north of 20° north Latitude and within 600 miles of the North American Continent; (*zones HF*)

"length" means length overall; (*longueur*)

[1] SOR, 65-279, *Canada Gazette* Part II, Vol. 99, No. 13, July 14, 1965
[2] SOR/71-267, *Canada Gazette* Part II, Vol. 105, No. 12, June 23, 1971
[3] SOR, 56-61, *Canada Gazette* Part II, Vol. 90, No. 4, February 22, 1956
[4] SOR, 63-348, *Canada Gazette* Part II, Vol. 97, No. 18, September 25, 1963

RSRN-3

Enregistrement
DORS/78-219 3 mars 1978

LOI SUR LA MARINE MARCHANDE DU CANADA
LOI SUR LA PRÉVENTION DE LA POLLUTION DES EAUX ARCTIQUES

Règlement sur les stations radio de navires

C.P. 1978-626 2 mars 1978

Sur avis conforme du ministre des Transports, il plaît à Son Excellence le Gouverneur général en conseil:

a) d'abroger, en vertu des articles 403 et 730 de la Loi sur la marine marchande du Canada, le Règlement sur la radio pour les stations de navire, Partie I établi par le décret C.P. 1965-1175 du 23 juin 1965[1], dans sa forme modifiée[2], et le Règlement sur la radio pour les stations de navire, Partie III établi par le décret C.P. 1956-192 du 2 février 1956[3], dans sa forme modifiée[4]; et

b) d'établir, en vertu des articles 403 et 730 de la Loi sur la marine marchande du Canada et de l'article 12 de la Loi sur la prévention de la pollution des eaux arctiques, le Règlement prescrivant les stations radio à installer sur les navires, ci-après,

à compter du 1er juin 1978.

RÈGLEMENT PRESCRIVANT LES STATIONS RADIO À INSTALLER SUR LES NAVIRES

Titre abrégé

1. *Règlement sur les stations radio de navires*.

Définitions

2. «Installation radiotélégraphique» ou «radiotéléphonique», celle conforme au *Règlement technique sur les stations radio de navires*. (*radiotelegraph installation* et *radiotelephone installation*)

«longueur», une longueur hors tout, (*length*)

«mille», un mille marin international de 1 852 m, (*mile*)

«navires de côte arctique», ceux visés au *Règlement sur la prévention de la pollution des eaux arctiques par les navires*, (*Arctic Class ship*)

«navires de type A», ceux visés au *Règlement sur la prévention de la pollution des eaux arctiques par les navires*, (*Type A ship*)

«tonneaux», de jauge brute, (*tons*)

[1] DORS/65-279, *Gazette du Canada* Partie II, Vol. 99, nº 13, 14 juillet 1965
[2] DORS/71-267, *Gazette du Canada* Partie II, Vol. 105, nº 12, 23 juin 1971
[3] DORS/56-61, *Gazette du Canada* Partie II, Vol. 90, nº 4, 22 février 1956
[4] DORS/63-348, *Gazette du Canada* Partie II, Vol. 97, nº 18, 25 septembre 1963

"MF coverage area" means all waters, except the waters of the VHF coverage area, that are within 150 miles

(*a*) of the Pacific coast between the Latitudes of 46° and 55° north Latitude including the inner passages of the Alaskan Pannandle, and

(*b*) of the Atlantic coast between the Latitudes of 40° and 65° north Latitude

and that are defined in the publication "Radio Aids to Marine Navigation" published by the Canadian Coast Guard, Department of Transport; (*zones MF*)

"mile" means the international nautical mile of 1,852 metres; (*mille*)

"minor waters voyage, class II" has the meaning assigned to that expression by section 6 of the *Home-Trade, Inland and Minor Waters Voyages Regulations*; (*voyages en eaux secondaires, classe II*)

"radiotelegraph installation" and "radiotelephone installation" means an installation that complies with the applicable requirements of the *Ship Station Technical Regulations*; (*installation radiotélégraphique* or *radiotéléphonique*)

"shipping safety control zone" has the same meaning as in the *Arctic Waters Pollution Prevention Act*; (*zones de contrôle*)

"tons" means gross tons; (*tonneaux*)

"towing ship" means a ship engaged in towing another ship or a floating object astern or alongside or in pushing another ship or a floating object ahead;

"Type A ship" has the same meaning as in the *Arctic Shipping Pollution Prevention Regulations*; (*navires de type A*)

"VHF coverage area" means

(*a*) the Great Lakes,

(*b*) the Saguenay River downstream from Chicoutimi,

(*c*) the St. Lawrence River as far seaward as a straight line drawn

(i) from Cap des Rosiers to West Point Anticosti Island, and

(ii) from Anticosti Island to the north shore of the St. Lawrence River along the meridian of longitude 63° west,

(*d*) Puget Sound, State of Washington, U.S.A., and

(*e*) all waters that are within a coverage radius of a Canadian Coast Guard radio station providing a continuous maritime mooile distress and safety service on 156.8 MHz and that are defined in the publication "Radio Aids to Marine Navigation" published by the Canadian Coast Guard, Department of Transport.

(*zones VHF*)

«voyages de cabotage, classe IV», ceux visés à l'article 4 du *Règlement sur les voyages de cabotage, en eaux intérieures et en eaux secondaires*, (*home-trade voyage, class IV*)

«voyages en eaux secondaires, classe II», ceux visés à l'article 6 du *Règlement sur les voyages de cabotage, en eaux intérieures et en eaux secondaires*, (*minor waters voyage, class II*)

«zones de contrôle», les zones de contrôle de la sécurité de la navigation visées à la *Loi sur la prévention de la pollution des eaux arctiques*, (*shipping safety control zone*)

«zones HF», les eaux, sauf celles des zones VHF et MF, se trouvant au nord du 20° de latitude nord et à l'intérieur de 600 milles du continent nord-américain. (*HF coverage area*)

«zones MF», toutes les eaux, sauf celles de la zone VHF se trouvant à l'intérieur de 150 milles

a) de la côte du Pacifique comprises entre le 46° et le 55° de latitude nord, y compris les passages intérieurs de la partie méridionale de l'Alaska et

b) de la côte Atlantique comprises entre le 40° et le 65° de latitude nord

et qui sont définies dans la publication «Aides radio à la navigation maritime» publiée par la Garde côtière canadienne, ministère des Transports, (*MF coverage area*)

«zones VHF», s'applique

a) aux Grands lacs,

b) à la rivière Saguenay en aval de Chicoutimi

c) au fleuve Saint-Laurent aussi loin en direction de la mer qu'une ligne droite tracée

(i) du cap des Rosiers à la pointe ouest de l'île d'Anticosti et

(ii) de l'île d'Anticosti à la rive nord du fleuve Saint-Laurent, le long du méridien de longitude 63° ouest,

d) au Puget Sound, État de Washington, É.-U., et

e) aux eaux situées dans un rayon de couverture d'une station radio de la Garde côtière canadienne assurant un service mobile maritime de détresse et de sécurité continu sur 156.8 MHz et qui sont définies dans la publication «Aides radio à la navigation maritime» publiée par la Garde côtière canadienne, ministère des Transports

(*VHF coverage area*)

Application

3. (1) Subject to subsections (3) and (4), these Regulations apply to

(*a*) every Canadian ship carrying pollutants and every non-Canadian ship carrying pollutants and engaged in the coasting trade of Canada that is

(i) in Canadian waters south of the sixtieth parallel of north latitude,

Application

3. (1) Sous réserve des paragraphes (3) et (4), le règlement s'applique

a) aux navires canadiens transportant des polluants et aux navires étrangers transportant des polluants et affectés au cabotage en eaux canadiennes, se trouvant

(i) dans les eaux canadiennes au sud du soixantième parallèle de latitude nord,

(ii) in Canadian waters north of the sixtieth parallel of north latitude that are not within a shipping safety control zone,

(iii) in a fishing zone of Canada prescribed pursuant to the *Territorial Sea and Fishing Zones Act*, or

(iv) navigating in a shipping safety control zone; and

(*b*) every Canadian ship that is navigating in any waters other than those described in subparagraphs (*a*)(i) to (iv).

(2) Subject to subsections (3) and (4), paragraph 4(1)(*a*), subsection 4(6) and section 5 apply to every non-Canadian ship carrying pollutants that is in the waters described in subparagraphs (1)(*a*)(i) to (iii) or navigating in a shipping safety control zone.

"(2.1) Subject to subsections (3) and (4),

(*a*) paragraph 4(1)(*c*) applies to every non-Canadian ship carrying pollutants that is navigating in shipping safety control zone 14, 15 or 16 as set out in the *Shipping Safety Control Zones Order*; and

(*b*) paragraph 4(1)(*d*) applies to every such ship that is navigating in any shipping safety control zone other than 14, 15 or 16 as set out in that Order." (SOR/78-756)

(3) Section 4 does not apply to

(*a*) a ship other than a towing ship that is under 300 tons, unless it is 20 metres or more in length, certified to carry more than 12 passengers for hire and engaged on a voyage other than a home trade voyage, class IV or a minor waters voyage, class II; or

(*b*) a towing ship that is

(i) under 300 tons unless

(A) its tow is a ship of 300 tons or more, or one or more floating objects having an aggregate dimension in any direction of 45 metres or more, or

(B) it is 20 metres or more in length, certified to carry more than 12 passengers for hire and engaged on a voyage other than a home-trade voyage, class IV or a minor waters voyage, class II, or

(ii) of any tonnage where

(A) its tow is a ship that complies with that section,

(B) one or more other towing ships are engaged in the same towing operation and the ship would comply with that section if it were fitted with all the radio installations fitted on those other towing ships, or

(C) the towing operation is undertaken in an emergency and it is not possible for the towing ship to comply with that section.

(4) Sections 4 and 5 do not apply to a ship that is

(*a*) making a minor waters voyage in waters other than those listed in the schedule;

(*b*) a non self-propelled dredge or similar floating plant that is not located in or near a channel or fairway or in any other place where it constitutes a hazard to passing ships; or

(*c*) a towing ship where the towing ship and its tow are located within a booming ground.

Radiotelephone Installations

4. (1) Subject to subsections (2) to (5), a ship

(*a*) within the VHF coverage area of the Great Lakes and the St. Lawrence River above St. Lambert Lock shall be fitted with at least two bridge-to-bridge VHF radiotelephone installations;

(ii) dans les eaux canadiennes au nord du soixantième parallèle de latitude nord non comprises dans les zones de contrôle,

(iii) dans les zones de pêche du Canada prescrites selon la *Loi sur la mer territoriale et les zones de pêche* ou

(iv) naviguant dans les zones de contrôle et

b) aux navires canadiens naviguant dans des eaux autres que celles visées aux sous-alinéas *a*)(i) à (iv).

(2) Sous réserve des paragraphes (3) et (4), l'alinéa (4)(1)*a*), le paragraphe 4(6) et l'article 5 s'appliquent aux navires étrangers transportant des polluants et se trouvant dans les eaux décrites aux sous-alinéas (1)*a*)(i) à (iii) ou naviguant dans des zones de contrôle.

«(2.1) Sous réserve des paragraphes (3) et (4),

a) l'alinéa 4(1)*c*) s'applique aux navires non-canadiens, transportant des polluants, qui naviguent dans les zones de contrôle 14, 15 ou 16 décrites dans le *Décret sur les zones de contrôle de la sécurité de la navigation*; et

b) l'alinéa 4(1)*d*) s'appliquent à ceux qui naviguent dans les autres zones.» (DORS/78-756)

(3) L'article 4 ne s'applique pas

a) à un navire autre qu'un remorqueur de moins de 300 tonneaux, à moins qu'il n'ait 20 m ou plus de longueur, qu'il ne soit homologué pour transporter plus de 12 passagers payants et qu'il n'effectue un voyage autre qu'un voyage de cabotage, classe IV ou en eaux secondaires, classe II ou

b) un remorqueur

(i) de moins de 300 tonneaux, à moins

(A) qu'il ne remorque un navire de 300 tonneaux ou plus, ou un ou plusieurs objets flottants ayant des dimensions globales en toute direction de 45 m ou plus, ou

(B) qu'il n'ait 20 m ou plus de longueur, qu'il ne soit homologué pour transporter plus de 12 passagers payants et qu'il n'effectue un voyage autre qu'un voyage de cabotage, classe IV ou en eaux secondaires, classe II ou

(ii) de toute jauge lorsque

(A) sa remorque est un navire qui se conforme à cet article,

(B) un ou plusieurs autres remorqueurs participent au même remorquage, le navire devant se conformer à cet article s'il est muni de toutes les installations radio dont sont pourvus les autres remorqueurs ou

(C) l'activité de remorquage est entreprise lors d'une situation d'urgence et qu'il est impossible au remorqueur de se conformer à cet article.

(4) Les articles 4 et 5 ne s'appliquent pas

a) à un navire effectuant un voyage en eaux secondaires dans des eaux autres que celles visées à l'annexe,

b) à un chaland non autopropulsé ou à une usine flottante semblable qui ne sont pas situés dans un chenal ou une voie navigable ou près de ces derniers ou à tout autre endroit où ils présentent un risque pour les navires qui passent ou

c) à un remorqueur, lorsque sa remorque et lui-même sont situés à l'intérieur d'une aire de flottage.

Installations radiotéléphoniques

4. (1) Les navires situés

a) à l'intérieur de la zone VHF des Grands lacs et du Saint-Laurent en amont de l'écluse de Saint-Lambert doivent être équipés d'au moins deux installations radiotéléphoniques VHF entre passerelles,

SSRR-6

(*b*) within any VHF coverage area other than the area described in paragraph (*a*) shall be fitted with at least

(i) two bridge-to-bridge VHF radiotelephone installations, or

(ii) one bridge-to-bridge VHF radiotelephone installation and one MF radiotelephone installation;

(*c*) within the MF coverage area shall be fitted with at least one bridge-to-bridge VHF radiotelephone installation and one MF radiotelephone installation; and

(*d*) outside the VHF and MF coverage areas shall be fitted with at least one bridge-to-bridge VHF radiotelephone installation, one MF radiotelephone installation and one combined MF/HF radiotelephone installation.

"(1.1) A ship of 300 tons or more making an international voyage after May 25, 1981 shall be fitted with a radiotelephone distress frequency watch receiver." SOR/81-316

(2) Where a ship described in subsection 6(2) is within a VHF coverage area, it shall be fitted with at least two bridge-to-bridge VHF radiotelephone installations.

(3) A ship outside the VHF and MF coverage areas need not be fitted with a combined MF/HF radiotelephone installation required by paragraph (1)(*d*) if that ship is fitted with an MF radiotelegraph installation that complies with the Safety Convention.

(4) A non-Canadian ship within shipping safety control zone 14, 15 or 16 need not be fitted with a MF radiotelephone installation required by paragraph (1)(*c*) if that ship is fitted with an MF radiotelegraph installation that complies with the Safety Convention.

"(5) A ship within the VHF coverage area described in paragraph (1)(*a*) need not be fitted with more than one VHF radio-telephone installation until January 1, 1979." (SOR/78-529)

(6) Where a ship of 20 metres or more in length is fitted with only one bridge-to-bridge VHF radiotelephone installation the ship shall, at the conning position, be fitted with

(*a*) an additional radio facility that provides continuous or sequential monitoring of channel 16 (156.8 MHz) which facility may be additional to or built into the bridge-to-bridge VHF radiotelephone installation; or

(*b*) an additional radio facility capable of receiving on a marine band, navigational warnings for the area in which the ship is navigating.

(7) A Type A or Arctic Class ship within any waters that are north of the sixty-fifth parallel of north Latitude and in a shipping safety control zone shall be fitted with telecommunication equipment that is capable of receiving fixed images transmitted from a Canadian radio station and an ice reconnaissance aircraft of the frequencies appropriate to the area of operation and of reproducing those images in a permanent form.

5. Every ship referred to in subsection 3(3) as a ship to which section 4 does not apply and that is

(*a*) 20 metres or more in length,

"(*b*) certified to carry more than 6 passengers and engaged on a voyage, any part of which is

(i) within a VHF coverage area, or

(ii) more than 5 miles from the shore, or" (SOR/78-756)

(*c*) a towing ship,

shall be fitted with at least one bridge-to-bridge VHF radiotelephone installation.

RSRN-6

b) à l'intérieur de toute zone VHF autre que celle decrite à l'alinea *a*) doivent être equipes au moins

(i) deux installations radiotéléphoniques VHF entre passerelles ou

(ii) d'une installation radiotéléphonique VHF entre passerelles et d'une installation radiotéléphonique MF,

c) à l'interieur d'une zone MF doivent être équipes au moins d'une installation radiotéléphonique VHF entre passerelles et d'une installation radiotéléphonique MF et

d) à l'exterieur des zones VHF et MF doivent être equipes au moins d'une installation radiotéléphonique VHF entre passerelles d'une installation radiotéléphonique MF et d'une installation radiotéléphonique combinée MF/HF

«(1.1) Les navires de 300 tonneaux ou plus, faisant un voyage international apres le 25 mai 1981, doivent être équipes d'un récepteur de veille sur la fréquence radiotéléphonique de detresse.» DORS/81-316

(2) Les navires visés au paragraphe 6(2) et situés à l'intérieur d'une zone VHF doivent être équipés d'au moins deux installations radiotéléphoniques VHF entre passerelles.

(3) Les navires situés à l'extérieur des zones VHF et MF ne sont pas tenus d'être equipés d'une installation radiotéléphonique combinée MF/HF exigée à l'alinea 1*d*) s'ils sont equipes d'une installation radiotélégraphique MF conformement à la Convention sur la sécurité.

(4) Les navires étrangers situés à l'intérieur des zones de contrôle 14, 15 ou 16 ne sont pas tenus d'être equipés d'une installation radiotéléphonique MF exigée à l'alinea (1)*c*) s'ils sont équipés d'une installation radiotelegraphique MF selon la Convention sur la sécurité.

«(5) Les navires situés à l'intérieur de la zone VHF décrite à l'alinea (1)*a*) ne sont pas tenus d'être equipes de plus d'une installation radiotéléphonique VHF avant le 1er janvier 1979.» (DORS/78-529)

(6) Les navires de 20 m ou plus de longueur equipés d'une seule installation radiotéléphonique VHF entre passerelles doivent être équipés à la timonerie

a) d'une installation radio additionnelle permettant d'assurer une ecoute continue ou sequentielle de la voie 16 (156.8 MHz) et cette installation peut être ajoutee ou integree à l'installation radiotéléphonique VHF entre passerelles ou

b) d'une installation radio additionnelle pouvant recevoir sur une bande maritime des avertissements sur la navigation dans le secteur ou se trouve le navire.

(7) Les navires de type A ou de côte arctique, situés dans les eaux au nord du soixante-cinquième parallèle de latitude nord et dans les zones de contrôle, doivent être equipes de materiel de télécommunication pouvant recevoir des images fixes transmises d'une station radio canadienne ou d'un aeronef de reconnaissance dans les glaces sur les frequences appropriees au secteur d'operation et pouvant reproduire des images sous forme permanente.

5. Les navires mentionnés au paragraphe 3(3) comme n'étant pas vises par l'article 4,

a) mesurant 20 m ou plus de longueur,

«*b*) homologués pour transporter plus de 6 passagers et effectuant partie d'un voyage

(i) dans une zone V.H.F., ou

(ii) à plus de cinq milles du rivage, ou» (DORS/78-756)

c) etant des remorqueurs,

doivent être équipés d'au moins une installation radiotelephonique VHF entre passerelles.

SSRR-7

Radiotelegraph Installations

6. (1) A Canadian Safety Convention ship that is

(*a*) a passenger ship, or

(*b*) a cargo ship of 1,600 tons or more and engaged on a voyage beyond the limits of the HF coverage area

shall be fitted with at least one MF radiotelegraph installation that complies with the Safety Convention.

(2) A non-Safety Convention passenger ship certified to carry

(*a*) 50 or more persons and engaged on a voyage that is more than 200 miles from one place to another,

(*b*) 250 or more persons and engaged on a voyage that is more than 90 miles from one place to another, or

(*c*) 500 or more persons and engaged on a voyage that is more than 20 miles from one place to another

shall, when it is within the HF or MF coverage area be fitted with at least one MF radiotelegraph installation or, after January 1, 1980, one radiotelex installation capable of receiving transmissions from a Canadian Coast Guard radio station appropriate to the area of operation.

Arctic Navigation

7. No ship shall navigate within any shipping safety control zone unless it complies with the applicable provisions of these Regulations.

Equivalents

8. Where these Regulations require a particular radiotelephone installation or radiotelegraph installation to be fitted in a ship or a particular provision to be made in a ship, the Chairman may, on receipt of an application made to him by the owner of the ship or his authorized representative, permit any other radiotelephone installation or radiotelegraph installation to be fitted in the ship or any other provision to be made if he is satisfied that such other installation or provision is at least equivalent to that required by these Regulations.

Fines

9. Every person who contravenes the provisions of the *Ship Station Technical Regulations* is guilty of an offence and liable on summary conviction to a fine not exceeding fifty dollars and costs.

Standards

10. Radio installations and equipment required by these Regulations shall at least comply with

(*a*) the *Ship Station Technical Regulations*; and

(*b*) the *Standards for Radio Installations and Related Equipment, 1981*, TP 2872, published by the Canadian Coast Guard, Department of Transport."

SOR/81-325

RSRN-7

Installations radiotélégraphiques

6. (1) Un navire canadien ressortissant à la Convention sur la sécurité étant

a) un navire à passagers ou

b) un navire de cargaison de 1 600 tonneaux ou plus naviguant en dehors de la zone HF

doit être équipé d'au moins une installation radiotélégraphique MF, selon la Convention sur la sécurité.

(2) Un navire à passagers ne ressortissant pas à la Convention sur la sécurité et homologué pour transporter

a) 50 personnes ou plus et effectuant un voyage de plus de 200 milles d'un endroit à un autre,

b) 250 personnes ou plus et effectuant un voyage de plus de 90 milles d'un endroit à un autre ou

c) 500 personnes ou plus et effectuant un voyage de plus de 20 milles d'un endroit à un autre

doit, lorsqu'il est situé à l'intérieur des zones HF ou MF, être équipé d'au moins une installation radiotélégraphique MF ou, après le 1er janvier 1980, d'une installation radiotélex pouvant recevoir des transmissions d'une station radio de la Garde côtière canadienne appropriée au secteur d'activité.

Navigation dans l'Arctique

7. Nul navire ne peut naviguer à l'intérieur d'une zone de contrôle à moins de se conformer au règlement.

Équivalences

8. Le président du Bureau d'inspection des navires à vapeur peut, à la réception d'une demande du propriétaire du navire ou de son représentant autorisé, permettre que le navire soit équipé de toute autre installation radiotéléphonique ou radiotélégraphique ou que toute autre disposition soit prise s'il estime que cette installation ou que cette disposition est au moins équivalente à celle prescrite par ce règlement.

Amendes

9. Quiconque contrevient au *Règlement technique sur les stations (radio) de navires* est coupable d'une infraction et est passible, sur déclaration sommaire de culpabilité, d'une amende d'au plus cinquante dollars et des frais.

«Normes

10. Les installations et le matériel radio prescrits par le présent règlement doivent au moins être conformes

a) au *Règlement technique sur les stations (radio) de navires*, et

b) aux *Normes concernant les installations de radio et le matériel connexe, 1981*, TP 2872, publiées par la Garde côtière canadienne, ministère des Transports.»

DORS/81-316

SCHEDULE

MINOR WATERS

Newfoundland

1. Humber Arm

Prince Edward Island

2. Charlottetown Harbour
3. Summerside Harbour

Nova Scotia

4. The Bras d'Or Lake
5. Halifax Harbour and the waters inside a line joining the triangulation station on Osborne Head to the eastern extremity of Chebucto Head

New Brunswick

6. Saint John Harbour
7. Miramichi Bay
8. Nepisiquit Bay
9. Dalhousie Harbour
10. Shippegan Sound

Quebec

11. St. Lawrence River

Ontario

12. St. Lawrence River
13. Detroit River
14. St. Clair River
15. St. Marys River

British Columbia

16. Alberni Inlet
17. Quatsino Sound
18. Jervis Inlet
19. Prince Rupert Harbour
20. Fraser River downstream from Pitt River
21. Skeena River downstream from Port Essington

ANNEXE

EAUX SECONDAIRES

Terre-Neuve

1. Humber Arm

Île-du-Prince-Édouard

2. le port de Charlottetown
3. le port de Summerside

Nouvelle-Écosse

4. le lac Bras d'Or
5. le port d'Halifax et les eaux délimitées par une ligne reliant la station de triangulation de Osborne Head à l'extrémité est de la pointe Chebucto

Nouveau-Brunswick

6. le port de Saint-Jean
7. la baie de Miramichi
8. la baie de Nepisiquit
9. le port de Dalhousie
10. le détroit de Shippegan

Québec

11. le fleuve Saint-Laurent

Ontario

12. le fleuve Saint-Laurent
13. la rivière Détroit
14. la rivière Sainte-Claire
15. la rivière Sainte-Marie

Colombie-Britannique

16. l'anse Alberni
17. le détroit de Quatsino
18. l'anse Jervis
19. le port de Prince Rupert
20. le fleuve Fraser, en aval de la rivière Pitt
21. la rivière Skeena en aval de Port Essington

APPENDIX B

RADIOTELEGRAPHY AND RADIOTELEPHONY REGULATIONS
UNDER THE
INTERNATIONAL CONFERENCE ON
SAFETY OF LIFE AT SEA
1984

(Includes a Listing of Parties to the
Solas Convention 1974)

CHAPTER IV

RADIOTELEGRAPHY AND RADIOTELEPHONY

PART A – APPLICATION AND DEFINITIONS

Regulation 1

Application

(a) Unless expressly provided otherwise, this Chapter applies to all ships to which the present Regulations apply.

(b) This Chapter does not apply to ships to which present Regulations would otherwise apply while such ships are being navigated within the Great Lakes of North America and their connecting and tributary waters as far east as the lower exit of the St. Lambert Lock at Montreal in the Province of Quebec, Canada.*

(c) No provision in this Chapter shall prevent the use by a ship or survival craft in distress of any means at its disposal to attract attention, make known its position and obtain help.

Regulation 2

Terms and Definitions

For the purpose of this Chapter the following terms shall have the meanings defined below. All other terms which are used in this Chapter and which are also defined in the Radio Regulations shall have the same meanings as defined in those Regulations:

(a) "Radio Regulations" means the Radio Regulations annexed to, or regarded as being annexed to, the most recent International Telecommunication Convention which may be in force at any time.

(b) "Radiotelegraph auto alarm" means an automatic alarm receiving apparatus which responds to the radiotelegraph alarm signal and has been approved.

(c) "Radiotelephone auto alarm" means an automatic alarm receiving apparatus which responds to the radiotelephone alarm signal and has been approved.

(d) "Radiotelephone station", "Radiotelephone installation" and "Watches – radiotelephone" shall be considered as relating to the medium frequency band, unless expressly provided otherwise.

(e) "Radio Officer" means a person holding at least a first or second class radiotelegraph operator's certificate, or a radiocommunication operator's

* Such ships are subject to special requirements relative to radio for safety purposes, as contained in the relevant agreement between Canada and the United States of America.

general certificate for the maritime mobile service, complying with the provisions of the Radio Regulations, who is employed in the radiotelegraph station of a ship which is provided with such a station in compliance with the provisions of Regulation 3 or Regulation 4 of this Chapter.

(f) "Radiotelephone operator" means a person holding an appropriate certificate complying with the provisions of the Radio Regulations.

(g) "Existing installation" means:

(i) an installation wholly installed on board a ship before the date on which the present Convention enters into force irrespective of the date on which acceptance by the respective Administration takes effect; and

(ii) an installation part of which was installed on board a ship before the date of entry into force of the present Convention and the rest of which consists either of parts installed in replacement of identical parts, or parts which comply with the requirements of this Chapter.

(h) "New installation" means any installation which is not an existing installation.

Regulation 3

Radiotelegraph Station

Passenger ships irrespective of size and cargo ships of 1,600 tons gross tonnage and upwards, unless exempted under Regulation 5 of this Chapter, shall be fitted with a radiotelegraph station complying with the provisions of Regulations 9 and 10 of this Chapter.

Regulation 4

Radiotelephone Station

Cargo ships of 300 tons gross tonnage and upwards but less than 1,600 tons gross tonnage, unless fitted with a radiotelegraph station complying with the provisions of Regulations 9 and 10 of this Chapter shall, provided they are not exempted under Regulation 5 of this Chapter, be fitted with a radiotelephone station complying with the provisions of Regulations 15 and 16 of this Chapter.

Regulation 5

Exemptions from Regulations 3 and 4

(a) The Contracting Governments consider it highly desirable not to deviate from the application of Regulations 3 and 4 of this Chapter; nevertheless the Administration may grant to individual passenger or cargo ships exemptions of a partial and/or conditional nature, or complete exemption from the requirements of Regulation 3 or Regulation 4 of this Chapter.

(b) The exemptions permitted under paragraph (a) of this Regulation shall be granted only to a ship engaged on a voyage where the maximum distance of the ship from the shore, the length of the voyage, the absence of general navigational hazards, and other conditions affecting safety are such as to render the full application of Regulation 3 or Regulation 4 of this Chapter unreasonable or unnecessary. When deciding whether or not to grant exemptions to individual ships, Administrations shall have regard to the effect that exemptions may have upon the general efficiency of the distress service for the safety of all ships. Administrations should bear in mind the desirability of requiring ships which are exempted from the requirement of Regulation 3 of this Chapter to be fitted with a radiotelephone station which complies with the provisions of Regulations 15 and 16 of this Chapter as a condition of exemption.

(c) Each Administration shall submit to the Organization as soon as possible after the first of January in each year a report showing all exemptions granted under paragraphs (a) and (b) of this Regulation during the previous calendar year and giving the reasons for granting such exemptions.

PART B – WATCHES

Regulation 6

Watches – Radiotelegraph

(a) Each ship which in accordance with Regulation 3 or Regulation 4 of this Chapter is fitted with a radiotelegraph station shall, while at sea, carry at least one radio officer and, if not fitted with a radiotelegraph auto alarm shall, subject to the provisions of paragraph (d) of this Regulation, listen continuously on the radiotelegraph distress frequency by means of a radio officer using headphones or a loudspeaker.

(b) Each passenger ship which in accordance with Regulation 3 of this Chapter is fitted with a radiotelegraph station, if fitted with a radiotelegraph auto alarm, shall, subject to the provisions of paragraph (d) of this Regulation, and while at sea, listen on the radiotelegraph distress frequency by means of a radio officer using headphones or a loudspeaker, as follows:

(i) if carrying or certificated to carry 250 passengers or less, at least 8 hours listening a day in the aggregate;

(ii) if carrying or certificated to carry more than 250 passengers and engaged on a voyage exceeding 16 hours' duration between two consecutive ports, at least 16 hours' listening a day in the aggregate. In this case the ship shall carry at least two radio officers;

(iii) if carrying or certificated to carry more than 250 passengers and engaged on a voyage of less than 16 hours' duration between two consecutive ports, at least 8 hours' listening a day in the aggregate.

(c) (i) Each cargo ship which in accordance with Regulation 3 of this Chapter is fitted with a radiotelegraph station, if fitted with a radiotelegraph auto alarm, shall, subject to the provisions of paragraph (d) of this Regulation, and while at sea, listen on the radiotelegraph distress frequency by means of a radio officer using headphones or a loudspeaker, for at least 8 hours a day in the aggregate.

(ii) Each cargo ship of 300 tons gross tonnage and upwards but less than 1,600 tons gross tonnage which is fitted with a radiotelegraph station as a consequence of Regulation 4 of this Chapter, if fitted with a radiotelegraph auto alarm shall, subject to the provisions of paragraph (d) of this Regulation, and while at sea, listen on the radiotelegraph distress frequency by means of a radio officer using headphones or a loudspeaker, during such periods as may be determined by the Administration. Administrations shall, however, have regard to the desirability of requiring, whenever practicable, a listening watch of at least 8 hours a day in the aggregate.

(d) (i) During the period when a radio officer is required by this Regulation to listen on the radiotelegraph distress frequency, the radio officer may discontinue such listening during the time when he is handling traffic on other frequencies, or performing other essential radio duties, but only if it is impracticable to listen by split headphones or loudspeaker. The listening watch shall always be maintained by a radio officer using headphones or a loudspeaker during the silence periods provided for by the Radio Regulations.

The term "essential radio duties" in this paragraph includes urgent repairs of:

(1) equipment for radiocommunication used for safety;

(2) radio navigational equipment by order of the master.

(ii) In addition to the provisions of sub-paragraph (i) of this paragraph, on ships other than multi-radio officer passenger ships, the radio officer may, in exceptional cases, i.e. when it is impractical to listen by split headphones or loudspeaker, discontinue listening by order of the master in order to carry out maintenance required to prevent imminent malfunction of:

– equipment for radiocommunication used for safety;
– radio navigational equipment;
– other electronic navigational equipment including its repair;

provided that:

(1) the radio officer, at the discretion of the Administration concerned, is appropriately qualified to perform these duties; and

(2) the ship is fitted with a receiving selector which meets the requirements of the Radio Regulations;

(3) the listening watch is always maintained by a radio officer using headphones or loudspeaker during the silence periods provided for by the Radio Regulations.

(e) In all ships fitted with a radiotelegraph auto alarm this radiotelegraph auto alarm shall, while the ship is at sea, be in operation whenever there is no listening being kept under paragraphs (b), (c) or (d) of this Regulation and, whenever practicable, during direction-finding operations.

(f) The listening periods provided for by this Regulation, including those which are determined by the Administration, should be maintained preferably during periods prescribed for the radiotelegraph service by the Radio Regulations.

Regulation 7

Watches – Radiotelephone

(a) Each ship which is fitted with a radiotelephone station in accordance with Regulation 4 of this Chapter shall, for safety purposes, carry at least one radiotelephone operator (who may be the master, an officer or a member of the crew holding a certificate for radiotelephony) and shall, while at sea, maintain continuous watch on the radiotelephone distress frequency in the place on board from which the ship is usually navigated, by use of a radiotelephone distress frequency watch receiver, using a loudspeaker, a filtered loudspeaker or radiotelephone auto alarm.

(b) Each ship which in accordance with Regulation 3 or Regulation 4 of this Chapter is fitted with a radiotelegraph station shall, while at sea, maintain continuous watch on the radiotelephone distress frequency in a place to be determined by the Administration, by use of a radiotelephone distress frequency watch receiver, using a loudspeaker, a filtered loudspeaker or radiotelephone auto alarm.

Regulation 8

Watches – VHF Radiotelephone

Each ship provided with a Very High Frequency (VHF) radiotelephone station, in accordance with Regulation 18 of Chapter V, shall maintain a listening watch on the bridge for such periods and on such channels as may be required by the Contracting Government referred to in that Regulation.

PART C – TECHNICAL REQUIREMENTS

Regulation 9

Radiotelegraph Stations

(a) The radiotelegraph station shall be so located that no harmful interference from extraneous mechanical or other noise will be caused to the proper reception of radio signals. The station shall be placed as high in the ship as is practicable, so that the greatest possible degree of safety may be secured.

(b) The radiotelegraph operating room shall be of sufficient size and of adequate ventilation to enable the main and reserve radiotelegraph installations to be operated efficiently, and shall not be used for any purpose which will interfere with the operation of the radiotelegraph station.

(c) The sleeping accommodation of at least one radio officer shall be situated as near as practicable to the radiotelegraph operating room. In new ships, this sleeping accommodation shall not be within the radiotelegraph operating room.

(d) There shall be provided between the radiotelegraph operating room and the bridge and one other place, if any, from which the ship is navigated, an

efficient two-way system for calling and voice communication which shall be independent of the main communication system on the ship.

(e) The radiotelegraph installation shall be installed in such a position that it will be protected against the harmful effects of water or extremes of temperature. It shall be readily accessible both for immediate use in case of distress and for repair.

(f) A reliable clock with a dial not less than 12.5 centimetres (5 inches) in diameter and a concentric seconds hand, the face of which is marked to indicate the silence periods prescribed for the radiotelegraph service by the Radio Regulations, shall be provided. It shall be securely mounted in the radiotelegraph operating room in such a position that the entire dial can be easily and accurately observed by the radio officer from the radiotelegraph operating position and from the position for testing the radiotelegraph auto alarm receiver.

(g) A reliable emergency light shall be provided in the radiotelegraph operating room, consisting of an electric lamp permanently arranged so as to provide satisfactory illumination of the operating controls of the main and reserve radiotelegraph installations and of the clock required by paragraph (f) of this Regulation. In new installations, this lamp shall, if supplied from the reserve source of energy required by sub-paragraph (a)(iii) of Regulation 10 of this Chapter, be controlled by two-way switches placed near the main entrance to the radiotelegraph operating room and at the radiotelegraph operating position, unless the layout of the radiotelegraph operating room does not warrant it. These switches shall be clearly labelled to indicate their purpose.

(h) Either an electric inspection lamp, operated from the reserve source of energy required by sub-paragraph (a) (iii) of Regulation 10 of this Chapter and provided with a flexible lead of adequate length, or a flashlight shall be provided and kept in the radiotelegraph operating room.

(i) The radiotelegraph station shall be provided with such spare parts, tools and testing equipment as will enable the radiotelegraph installation to be maintained in efficient working condition while at sea. The testing equipment shall include an instrument or instruments for measuring A.C. volts, D.C. volts and ohms.

(j) If a separate emergency radiotelegraph operating room is provided the requirements of paragraphs (d), (e), (f), (g) and (h) of this Regulation shall apply to it.

Regulation 10

Radiotelegraph Installations

(a) Except as otherwise expressly provided in this Regulation:

(i) The radiotelegraph station shall include a main installation and reserve installation, electrically separate and electrically independent of each other.

(ii) The main installation shall include a main transmitter, main receiver, radiotelephone distress frequency watch receiver, and main source of energy.

(iii) The reserve installation shall include a reserve transmitter, reserve receiver and reserve source of energy.

(iv) A main and a reserve antenna shall be provided and installed, provided that the Administration may except any ship from the provision of a reserve antenna if it is satisfied that the fitting of such an antenna is impracticable or unreasonable, but in such case a suitable spare antenna completely assembled for immediate installation shall be carried. In addition, sufficient antenna wire and insulators shall in all cases be provided to enable a suitable antenna to be erected. The main antenna, if suspended between supports liable to whipping, shall be suitably protected against breakage.

(b) In installations on cargo ships (except those on cargo ships of 1,600 tons gross tonnage and upwards installed on or after 19 November 1952), if the main transmitter complies with all the requirements for the reserve transmitter, the latter is not obligatory.

(c) (i) The main and reserve transmitters shall be capable of being quickly connected with and tuned to the main antenna, and the reserve antenna if one is fitted.

(ii) The main and reserve receivers shall be capable of being quickly connected with any antenna with which they are required to be used.

(d) All parts of the reserve installation shall be placed as high in the ship as is practicable, so that the greatest possible degree of safety may be secured.

(e) The main and reserve transmitters shall be capable of transmitting on the radiotelegraph distress frequency using a class of emission assigned by the Radio Regulations for that frequency. In addition, the main transmitter shall be capable of transmitting on at least two working frequencies in the authorized bands between 405 kHz and 535 kHz, using classes of emission assigned by the Radio Regulations for these frequencies. The reserve transmitter may consist of a ship's emergency transmitter, as defined in and limited in use by the Radio Regulations.

(f) The main and reserve transmitters shall, if modulated emission is prescribed by the Radio Regulations, have a depth of modulation of not less than 70 per cent and a note frequency between 450 amd 1,350 Hz.

(g) The main and reserve transmitters shall, when connected to the main antenna, have a minimum normal range as specified below, that is to say, they must be capable of transmitting clearly perceptible signals from ship to ship by

	Minimum normal range in miles	
	Main transmitter	Reserve transmitter
All passenger ships, and cargo ships of 1,600 tons gross tonnage and upwards	150	100
Cargo ships below 1,600 tons gross tonnage	100	75

day and under normal conditions and circumstances over the specified ranges.* (Clearly perceptible signals will normally be received if the R.M.S. value of the field strength at the receiver is at least 50 microvolts per metre.)

(h) (i) The main and reserve receivers shall be capable of receiving the radiotelegraph distress frequency and the classes of emission assigned by the Radio Regulations for that frequency.

(ii) In addition, the main receiver shall permit the reception of such of the frequencies and classes of emission used for the transmission of time signals, meteorological messages and such other communications relating to safety of navigation as may be considered necessary by the Administration.

(iii) The radiotelephone distress frequency watch receiver shall be preset to this frequency. It shall be provided with a filtering unit or a device to silence the loudspeaker if on the bridge in the absence of a radiotelephone alarm signal. The device shall be capable of being easily switched in and out and may be used when, in the opinion of the master, conditions are such that maintenance of the listening watch would interfere with the safe navigation of the ship.

(iv) (1) A radiotelephone transmitter, if provided, shall be fitted with an automatic device for generating the radiotelephone alarm signal, so designed as to prevent actuation by mistake, and complying with the requirements of paragraph (e) of Regulation 16 of this Chapter. The device shall be capable of being taken out of operation at any time in order to permit the immediate transmission of a distress message.

(2) Arrangements shall be made to check periodically the proper functioning of the automatic device for generating the radio-

---

* In the absence of a direct measurement of the field strength the following data may be used as a guide for approximately determining the normal range:

Normal range in miles	Metre-amperes[1]	Total antenna power (watts)[2]
200	128	200
175	102	125
150	76	71
125	58	41
100	45	25
75	34	14

[1] This figure represents the product of the maximum height of the antenna above the deepest load water-line in metres and the antenna current in amperes (R.M.S. value). The values given in the second column of the table correspond to an average value of the ratio

$$\frac{\text{effective antenna height}}{\text{maximum antenna height}} = 0.47$$

This ratio varies with local conditions of the antenna and may vary between about 0.3 and 0.7.

[2] The values given in the third column of the table correspond to an average value of the ratio

$$\frac{\text{radiated antenna power}}{\text{total antenna power}} = 0.08$$

This ratio varies considerably according to the values of effective antenna height and antenna resistance.

telephone alarm signal on frequencies other than the radiotelephone distress frequency using a suitable artificial antenna.

(i) The main receiver shall have sufficient sensitivity to produce signals in headphones or by means of a loudspeaker when the receiver input is as low as 50 microvolts. The reserve receiver shall have sufficient sensitivity to produce such signals when the receiver input is as low as 100 microvolts.

(j) There shall be available at all times, while the ship is at sea, a supply of electrical energy sufficient to operate the main installation over the normal range required by paragraph (g) of this Regulation as well as for the purpose of charging any batteries forming part of the radiotelegraph station. The voltage of the supply for the main installation shall, in the case of new ships, be maintained within ± 10 per cent of the rated voltage. In the case of existing ships, it shall be maintained as near the rated voltage as possible and, if practicable, within ± 10 per cent.

(k) The reserve installation shall be provided with a source of energy independent of the propelling power of the ship and of the ship's electrical system.

(l) (i) The reserve source of energy shall preferably consist of accumulator batteries, which may be charged from the ship's electrical system, and shall under all circumstances be capable of being put into operation rapidly and of operating the reserve transmitter and receiver for at least six hours continuously under normal working conditions besides any of the additional loads mentioned in paragraphs (m) and (n) of this Regulation.*

(ii) The reserve source of energy is required to be of a capacity sufficient to operate simultaneously the reserve transmitter and the VHF installation, when fitted, for at least six hours unless a switching device is fitted to ensure alternate operation only. VHF usage of the reserve source of energy shall be limited to distress, urgency and safety communications. Alternatively, a separate reserve source of energy may be provided for the VHF installation.

(m) The reserve source of energy shall be used to supply the reserve installation and the automatic alarm signal keying device specified in paragraph (r) of this Regulation if it is electrically operated.

The reserve source of energy may also be used to supply:

(i) the radiotelegraph auto alarm;

(ii) the emergency light specified in paragraph (g) of Regulation 9 of this Chapter;

(iii) the direction-finder;

(iv) the VHF installation;

* For the purpose of determining the electrical load to be supplied by the reserve source of energy, the following formula is recommended as a guide:

½ of the transmitter current consumption with the key down (mark)
+ ½ of the transmitter current consumption with the key up (space)
+ current consumption of receiver and additional circuits connected to the reserve source of energy.

(v) the device for generating the radiotelephone alarm signal, if provided;

(vi) any device, prescribed by the Radio Regulations, to permit changeover from transmission to reception and vice versa.

Subject to the provisions of paragraph (n) of this Regulation, the reserve source of energy shall not be used other than for the purposes specified in this paragraph.

(n) Notwithstanding the provisions of paragraph (m) of this Regulation, the Administration may authorize the use in cargo ships of the reserve source of energy for a small number of low-power emergency circuits which are wholly confined to the upper part of the ship, such as emergency lighting on the boat deck, on condition that these can be readily disconnected if necessary, and that the source of energy is of sufficient capacity to carry the additional load or loads.

(o) The reserve source of energy and its switchboard shall be as high as practicable in the ship and readily accessible to the radio officer. The switchboard shall, wherever possible, be situated in a radio room; if it is not, it shall be capable of being illuminated.

(p) While the ship is at sea, accumulator batteries, whether forming part of the main installation or reserve installation, shall be brought up to the normal fully-charged condition daily.

(q) All steps shall be taken to eliminate so far as is possible the causes of, and to suppress, radio interference from electrical and other apparatus on board. If necessary, steps shall be taken to ensure that the antennae attached to broadcast receivers do not cause interference to the efficient or correct working of the radiotelegraph installation. Particular attention shall be paid to this requirement in the design of new ships.

(r) In addition to a means for manually transmitting the radiotelegraph alarm signal, an automatic radiotelegraph alarm signal keying device shall be provided, capable of keying the main and the reserve transmitters so as to transmit the radiotelegraph alarm signal. The device shall be capable of being taken out of operation at any time in order to permit immediate manual operation of the transmitter. If electrically operated, this keying device shall be capable of operation from the reserve source of energy.

(s) At sea, the reserve transmitter, if not used for communications, shall be tested daily using a suitable artificial antenna, and at least once during each voyage using the reserve antenna if installed. The reserve source of energy shall also be tested daily.

(t) All equipment forming part of the radiotelegraph installation shall be reliable, and shall be so constructed that it is readily accessible for maintenance purposes.

(u) Notwithstanding the provision of Regulation 4 of this Chapter, the Administration may, in the case of cargo ships of less than 1,600 tons gross tonnage, relax the full requirements of Regulation 9 of this Chapter and the

present Regulation, provided that the standard of the radiotelegraph station shall in no case fall below the equivalent of that prescribed under Regulation 15 and Regulation 16 of this Chapter for radiotelephone stations, so far as applicable. In particular, in the case of cargo ships of 300 tons gross tonnage and upwards but less than 500 tons gross tonnage, the Administration need not require:

(i) a reserve receiver;

(ii) a reserve source of energy in existing installations;

(iii) protection of the main antenna against breakage by whipping;

(iv) the means of communication between the radiotelegraph station and the bridge to be independent of the main communication system;

(v) the range of the transmitter to be greater than 75 miles.

Regulation 11

Radiotelegraph Auto Alarms

(a) Any radiotelegraph auto alarm installed after 26 May 1965 shall comply with the following minimum requirements:

(i) In the absence of interference of any kind it shall be capable of being actuated, without manual adjustment, by any radiotelegraph alarm signal transmitted on the radiotelegraph distress frequency by any coast station, ship's emergency or survival craft transmitter operating in accordance with the Radio Regulations, provided that the strength of the signal at the receiver input is greater than 100 microvolts and less than 1 volt.

(ii) In the absence of interference of any kind, it shall be actuated by either three or four consecutive dashes when the dashes vary in length from 3.5 to as near 6 seconds as possible and the spaces vary in length between 1.5 seconds and the lowest practicable value, preferably not greater than 10 milliseconds.

(iii) It shall not be actuated by atmospherics or by any signal other than the radiotelegraph alarm signal, provided that the received signals do not in fact constitute a signal falling within the tolerance limits indicated in sub-paragraph (ii) above.

(iv) The selectivity of the radiotelegraph auto alarm shall be such as to provide a practically uniform sensitivity over a band extending not less than 4 kHz and not more than 8 kHz on each side of the radiotelegraph distress frequency and to provide outside this band a sensitivity which decreases as rapidly as possible in conformity with the best engineering practice.

(v) If practicable, the radiotelegraph auto alarm shall, in the presence of atmospherics or interfering signals, automatically adjust itself so that within a reasonably short time it approaches the condition in which it can most readily distinguish the radiotelegraph alarm signal.

(vi) When actuated by a radiotelegraph alarm signal, or in the event of failure of the apparatus, the radiotelegraph auto alarm shall cause

a continuous audible warning to be given in the radiotelegraph operating room, in the radio officer's sleeping accommodation and on the bridge. If practicable, warning shall also be given in the case of failure of any part of the whole alarm receiving system. Only one switch for stopping the warning shall be provided and this shall be situated in the radiotelegraph operating room.

(vii) For the purpose of regularly testing the radiotelegraph auto alarm, the apparatus shall include a generator pre-tuned to the radiotelegraph distress frequency and a keying device by means of which a radiotelegraph alarm signal of the minimum strength indicated in sub-paragraph (i) above is produced. A means shall also be provided for attaching headphones for the purpose of listening to signals received on the radiotelegraph auto alarm.

(viii) The radiotelegraph auto alarm shall be capable of withstanding vibration, humidity and changes of temperature, equivalent to severe conditions experienced on board ships at sea, and shall continue to operate under such conditions.

(b) Before a new type of radiotelegraph auto alarm is approved, the Administration concerned shall be satisfied, by practical tests made under operating conditions equivalent to those obtaining in practice, that the apparatus complies with paragraph (a) of this Regulation.

(c) In ships fitted with a radiotelegraph auto alarm, its efficiency shall be tested by a radio officer at least once every 24 hours while at sea. If it is not in working order, the radio officer shall report that fact to the master or officer on watch on the bridge.

(d) A radio officer shall periodically check the proper functioning of the radiotelegraph auto alarm receiver, with its normal antenna connected, by listening to signals and by comparing them with similar signals received on the radiotelegraph distress frequency on the main installation.

(e) As far as practicable, the radiotelegraph auto alarm, when connected to an antenna shall not affect the accuracy of the direction-finder.

Regulation 12

Direction-Finders

(a) (i) The direction-finding apparatus required by Regulation 12 of Chapter V shall be efficient and capable of receiving signals with the minimum of receiver noise and of taking bearings from which the true bearing and direction may be determined.

(ii) It shall be capable of receiving signals on the radiotelegraph frequencies assigned by the Radio Regulations for the purposes of distress and direction-finding and for maritime radio beacons.

(iii) In the absence of interference the direction-finding apparatus shall have a sensitivity sufficient to permit accurate bearings being taken on a signal having a field strength as low as 50 microvolts per metre.

(iv) As far as is practicable, the direction-finding apparatus shall be so located that as little interference as possible from mechanical or other noise will be caused to the efficient determination of bearings.

(v) As far as is practicable, the direction-finding antenna system shall be erected in such a manner that the efficient determination of bearings will be hindered as little as possible by the close proximity of other antennae, derricks, wire halyards or other large metal objects.

(vi) An efficient two-way means of calling and voice communication shall be provided between the direction-finder and the bridge.

(vii) All direction-finders shall be calibrated to the satisfaction of the Administration on first installation. The calibration shall be verified by check bearings or by a further calibration whenever any changes are made in the position of any antennae or of any structures on deck which might affect appreciably the accuracy of the direction-finder. The calibration particulars shall be checked at yearly intervals, or as near thereto as possible. A record shall be kept of the calibrations and of any checks made of their accuracy.

(b) (i) Radio equipment for homing on the radiotelephone distress frequency shall be capable of taking direction-finding bearings on that frequency without ambiguity of sense within an arc of 30 degrees on either side of the bow.

(ii) When installing and testing the equipment referred to in this paragraph due regard should be given to the relevant recommendation of the International Radio Consultative Committee (CCIR).

(iii) All reasonable steps shall be taken to ensure the homing capability required by this paragraph. In cases where due to technical difficulties the homing capability cannot be achieved, Administrations may grant to individual ships exemptions from the requirements of this paragraph.

Regulation 13

Radiotelegraph Installation for Fitting in Motor Lifeboats

(a) The radiotelegraph installation required by Regulation 14 of Chapter III shall include a transmitter, a receiver and a source of energy. It shall be so designed that it can be used in an emergency by an unskilled person.

(b) The transmitter shall be capable of transmitting on the radiotelegraph distress frequency using a class of emission assigned by the Radio Regulations for that frequency. The transmitter shall also be capable of transmitting on the frequency, and of using a class of emission, assigned by the Radio Regulations for use by survival craft in the bands between 4,000 kHz and 27,500 kHz.

(c) The transmitter shall, if modulated emission is prescribed by the Radio Regulations, have a depth of modulation of not less than 70 per cent and a note frequency between 450 and 1,350 Hz.

(d) In addition to a key for manual transmissions, the transmitter shall be fitted with an automatic keying device for the transmission of the radiotelegraph alarm and distress signals.

(e) On the radiotelegraph distress frequency the transmitter shall have a minimum normal range (as specified in paragraph (g) of Regulation 10 of this Chapter) of 25 miles using the fixed antenna.*

(f) The receiver shall be capable of receiving the radiotelegraph distress frequency and the classes of emission assigned by the Radio Regulations for that frequency.

(g) The source of energy shall consist of an accumulator battery with sufficient capacity to supply the transmitter for four hours continuously under normal working conditions. If the battery is of a type that requires charging, means shall be available for charging it from the ship's power supply. In addition there shall be a means for charging it after the lifeboat has been launched.

(h) When the power for the radiotelegraph installation and the searchlight required by Regulation 14 of Chapter III are drawn from the same battery, it shall have sufficient capacity to provide for the additional load of the searchlight.

(i) A fixed-type antenna will be provided together with means for supporting it at the maximum practicable height. In addition an antenna supported by a kite or balloon shall be provided if practicable.

(j) At sea a radio officer shall at weekly intervals test the transmitter using a suitable artificial antenna, and shall bring the battery up to full charge if it is of a type which requires charging.

Regulation 14

Portable Radio Apparatus for Survival Craft

(a) The apparatus required by Regulation 13 of Chapter III shall include a transmitter, a receiver, an antenna and a source of energy. It shall be so designed that it can be used in an emergency by an unskilled person.

(b) The apparatus shall be readily portable, watertight, capable of floating in sea water and capable of being dropped into the sea without damage. New equipment shall be as light-weight and compact as practicable and shall preferably be capable of use in both lifeboats and liferafts.

(c) The transmitter shall be capable of transmitting on the radiotelegraph distress frequency using a class of emission assigned by the Radio Regulations for that frequency, and, in the bands between 4,000 kHz and 27,500 kHz, of transmitting on the radiotelegraph frequency, and of using a class of emission assigned by the Radio Regulations for survival craft. However, the Administration may permit the transmitter to be capable of transmitting on the radiotelephone distress frequency, and of using a class of emission assigned by the

* In the absence of a measurement of the field strength, it may be assumed that this range will be obtained if the product of the height of the antenna above the water-line and the antenna current (R.M.S. value) is 10 metre-amperes.

Radio Regulations for that frequency, as an alternative or in addition to transmission on the radiotelegraph frequency assigned by the Radio Regulations for survival craft in the bands between 4,000 kHz and 27,500 kHz.

(d) The transmitter shall, if modulated emission is prescribed by the Radio Regulations, have a depth of modulation of not less than 70 per cent and in the case of radiotelegraph emission have a note frequency between 450 and 1,350 Hz.

(e) In addition to a key for manual transmissions, the transmitter shall be fitted with an automatic keying device for the transmission of the radiotelegraph alarm and distress signals. If the transmitter is capable of transmitting on the radiotelephone distress frequency, it shall be fitted with an automatic device, complying with the requirements of paragraph (e) of Regulation 16 of this Chapter, for transmitting the radiotelephone alarm signal.

(f) The receiver shall be capable of receiving the radiotelegraph distress frequency and the classes of emission assigned by the Radio Regulations for that frequency. If the transmitter is capable of transmitting on the radiotelephone distress frequency the receiver shall also be capable of receiving that frequency and a class of emission assigned by the Radio Regulations for that frequency.

(g) The antenna shall be either self-supporting or capable of being supported by the mast of a lifeboat at the maximum practicable height. In addition it is desirable that an antenna supported by a kite or balloon shall be provided if practicable.

(h) The transmitter shall supply an adequate radio frequency power* to the antenna required by paragraph (a) of this Regulation and shall preferably derive its supply from a hand generator. If operated from a battery, the battery shall comply with conditions laid down by the Administration to ensure that it is of a durable type and is of adequate capacity.

(i) At sea a radio officer or a radiotelephone operator, as appropriate, shall at weekly intervals test the transmitter, using a suitable artificial antenna and shall bring the battery up to full charge if it is of a type which requires charging.

(j) For the purpose of this Regulation, new equipment means equipment supplied to a ship after the date of entry into force of the present Convention.

Regulation 15

Radiotelephone Stations

(a) The radiotelephone station shall be in the upper part of the ship and so located that it is sheltered to the greatest possible extent from noise which might impair the correct reception of messages and signals.

* It may be assumed that the purposes of this Regulation will be satisfied by the following performance:

At least 10 watts input to the anode of the final stage or a radio-frequency output of at least 2.0 watts (A2 emission) at 500 kHz into an artificial antenna having an effective resistance of 15 ohms and 100×10^{-12} farads capacitance in series. The depth of modulation shall be at least 70 per cent.

(b) There shall be efficient communication between the radiotelephone station and the bridge.

(c) A reliable clock shall be securely mounted in such a position that the entire dial can be easily observed from the radiotelephone operating position.

(d) A reliable emergency light shall be provided, independent of the system which supplies the normal lighting of the radiotelephone installation, and permanently arranged so as to be capable of providing adequate illumination of the operating controls of the radiotelephone installation, of the clock required by paragraph (c) of this Regulation and of the card of instructions required by paragraph (f).

(e) Where a source of energy consists of a battery or batteries, the radiotelephone station shall be provided with a means of assessing the charge condition.

(f) A card of instructions giving a clear summary of the radiotelephone distress procedure shall be displayed in full view of the radiotelephone operating position.

Regulation 16

Radiotelephone Installations

(a) The radiotelephone installation shall include transmitting and receiving equipment, and appropriate sources of energy (referred to in the following paragraphs as "the transmitter", "the receiver", "the radiotelephone distress frequency watch receiver", and "the source of energy" respectively).

(b) The transmitter shall be capable of transmitting on the radiotelephone distress frequency and on at least one other frequency in the bands between 1,605 kHz and 2,850 kHz, using the classes of emission assigned by the Radio Regulations for these frequencies. In normal operation a double sideband transmission or a single sideband transmission with full carrier (i.e., A3H) shall have a depth of modulation of at least 70 per cent at peak intensity. Modulation of a single sideband transmission with reduced or suppressed carrier (A3A, A3J) shall be such that the intermodulation products shall not exceed the values given in the Radio Regulations.

(c) (i) In the case of cargo ships of 500 tons gross tonnage and upwards but less than 1,600 tons gross tonnage the transmitter shall have a minimum normal range of 150 miles, i.e., it shall be capable of transmitting clearly perceptible signals from ship to ship by day and under normal conditions and circumstances over this range.* (Clearly perceptible signals will normally be received if the R.M.S. value of the field strength produced at the receiver by the unmodulated carrier is at least 25 microvolts per metre.)

(ii) In the case of cargo ships of 300 tons gross tonnage and upwards but less than 500 tons gross tonnage:

* In the absence of field strength measurements, it may be assumed that this range will be obtained by a power in the antenna of 15 watts (unmodulated carrier) with an antenna efficiency of 27 per cent.

(1) for existing installations the transmitter shall have a minimum normal range of at least 75 miles; and

(2) for new installations the transmitter shall produce a power in the antenna of at least 15 watts (unmodulated carrier).

(d) The transmitter shall be fitted with a device for generating the radiotelephone alarm signal by automatic means so designed as to prevent actuation by mistake. The device shall be capable of being taken out of operation at any time in order to permit the immediate transmission of a distress message. Arrangements shall be made to check periodically the proper functioning of the device on frequencies other than the radiotelephone distress frequency using a suitable artificial antenna.

(e) The device required by paragraph (d) of this Regulation shall comply with the following requirements:

(i) The tolerance of the frequency of each tone shall be ± 1.5 per cent.

(ii) The tolerance on the duration of each tone shall be ± 50 milliseconds.

(iii) The interval between successive tones shall not exceed 50 milliseconds.

(iv) The ratio of the amplitude of the stronger tone to that of the weaker shall be within the range 1 to 1.2.

(f) The receiver required by paragraph (a) of this Regulation shall be capable of receiving the radiotelephone distress frequency and at least one other frequency available for maritime radiotelephone stations in the bands between 1,605 kHz and 2,850 kHz, using the classes of emission assigned by the Radio Regulations for these frequencies. In addition the receiver shall permit the reception of such other frequencies, using the classes of emission assigned by the Radio Regulations, as are used for the transmission by radiotelephony of meteorological messages and such other communications relating to the safety of navigation as may be considered necessary by the Administration. The receiver shall have sufficient sensitivity to produce signals by means of a loudspeaker when the receiver input is as low as 50 microvolts.

(g) The radiotelephone distress frequency watch receiver shall be preset to this frequency. It shall be provided with a filtering unit or a device to silence the loudspeaker in the absence of a radiotelephone alarm signal. The device shall be capable of being easily switched in and out and may be used when, in the opinion of the master, conditions are such that maintenance of the listening watch would interfere with the safe navigation of the ship.

(h) To permit rapid change-over from transmission to reception when manual switching is used, the control for the switching device shall, where practicable, be located on the microphone or the telephone handset.

(i) While the ship is at sea, there shall be available at all times a main source of energy sufficient to operate the installation over the normal range required by paragraph (c) of this Regulation. If batteries are provided they shall under all circumstances have sufficient capacity to operate the transmitter and receiver for

at least six hours continuously under normal working conditions.* In installations in cargo ships of 500 tons gross tonnage and upwards but less than 1,600 tons gross tonnage made on or after 19 November 1952, a reserve source of energy shall be provided in the upper part of the ship unless the main source of energy is so situated.

(j) The reserve source of energy, if provided, may be used only to supply:

(i) the radiotelephone installation;

(ii) the emergency light required by paragraph (d) of Regulation 15 of this Chapter;

(iii) the device required by paragraph (d) of this Regulation, for generating the radiotelephone alarm signal; and

(iv) the VHF installation.

(k) Notwithstanding the provisions of paragraph (j) of this Regulation, the Administration may authorize the use of the reserve source of energy, if provided, for a direction-finder, if fitted, and for a number of low-power emergency circuits which are wholly confined to the upper part of the ship, such as emergency lighting on the boat deck, on condition that the additional loads can be readily disconnected, and that the source of energy is of sufficient capacity to carry them.

(l) While at sea, any battery provided shall be kept charged so as to meet the requirements of paragraph (i) of this Regulation.

(m) An antenna shall be provided and installed and, if suspended between supports liable to whipping, shall in the case of cargo ships of 500 tons gross tonnage and upwards but less than 1,600 tons gross tonnage be protected against breakage. In addition, there shall be a spare antenna completely assembled for immediate replacement or, where this is not practicable, sufficient antenna wire and insulators to enable a spare antenna to be erected. The necessary tools to erect an antenna shall also be provided.

Regulation 17

VHF Radiotelephone Stations

(a) When a VHF radiotelephone station is provided in accordance with Regulation 18 of Chapter V, it shall be in the upper part of the ship and include a VHF radiotelephone installation complying with the provisions of this Regulation and comprising a transmitter and receiver, a source of power capable of actuating them at their rated power levels, and an antenna suitable for efficient radiating and receiving signals at the operating frequencies.

---

* For the purpose of determining the electrical load to be supplied by batteries required to have six hours reserve capacity, the following formula is recommended as a guide:
½ of the current consumption necessary for speech transmission
+ current consumption of receiver
+ current consumption of all additional loads to which the batteries may supply energy in time of distress or emergency.

(b) Such a VHF installation shall conform to the requirements laid down in the Radio Regulations for equipment used in the VHF Maritime Mobile Radiotelephone Service and shall be capable of operation on those channels specified by the Radio Regulations and as may be required by the Contracting Government referred to in Regulation 18 of Chapter V.

(c) The Contracting Government shall not require the transmitter R.F. carrier power output to be greater than 10 watts. The antenna shall, in so far as is practicable, have an unobstructed view in all directions.*

(d) Control of the VHF channels required for navigational safety shall be immediately available on the bridge convenient to the conning position and, where necessary, facilities should also be available to permit radiocommunications from the wings of the bridge.

Regulation 18

Radiotelephone Auto Alarms

(a) The radiotelephone auto alarm shall comply with the following minimum requirements:

(i) the frequencies of maximum response of the tuned circuits, and other tone selecting devices, shall be subject to a tolerance of ± 1.5 per cent in each instance; and the response shall not fall below 50 per cent of the maximum response for frequencies within 3 per cent of the frequency of maximum response;

(ii) in the absence of noise and interference, the automatic receiving equipment shall be capable of operating from the alarm signal in a period of not less than four and not more than six seconds;

(iii) the automatic receiving equipment shall respond to the alarm signal, under conditions of intermittent interference caused by atmospherics and powerful signals other than the alarm signal, preferably without any manual adjustment being required during any period of watch maintained by the equipment;

(iv) the automatic receiving equipment shall not be actuated by atmospherics or by strong signals other than the alarm signal;

(v) the automatic receiving equipment shall be effective beyond the range at which speech transmission is satisfactory;

(vi) the automatic receiving equipment shall be capable of withstanding vibration, humidity, changes of temperature and variations in power supply voltage equivalent to the severe conditions experienced on board ships at sea, and shall continue to operate under such conditions;

* For guidance purposes, it is assumed that each ship would be fitted with a vertically polarized unity gain antenna at a nominal height of 9.15 metres (30 feet) above water, a transmitter R.F. power output of 10 watts, and a receiver sensitivity of 2 microvolts across the input terminals for 20 db signal-to-noise ratio.

(vii) the automatic receiving equipment should, as far as practicable, give warning of faults that would prevent the apparatus from performing its normal functions during watch hours.

(b) Before a new type of radiotelephone auto alarm is approved, the Administration concerned shall be satisfied by practical tests, made under operating conditions equivalent to those obtained in practice, that the apparatus complies with paragraph (a) of this Regulation.

PART D – RADIO LOGS

Regulation 19

Radio Logs

(a) The radio log (diary of the radio service) required by the Radio Regulations for a ship which is fitted with a radiotelegraph station in accordance with Regulation 3 or Regulation 4 of this Chapter shall be kept in the radiotelegraph operating room during the voyage. Every radio officer shall enter in the log his name, the times at which he goes on and off watch, and all incidents connected with the radio service which occur during his watch which may appear to be of importance to safety of life at sea. In addition, there shall be entered in the log:

(i) the entries required by the Radio Regulations;

(ii) details of the maintenance, including a record of the charging of the batteries, in such form as may be prescribed by the Administration;

(iii) a daily statement that the requirement of paragraph (p) of Regulation 10 of this Chapter has been fulfilled;

(iv) details of the tests of the reserve transmitter and reserve source of energy made under paragraph (s) of Regulation 10 of this Chapter;

(v) in ships fitted with a radiotelegraph auto alarm details of tests made under paragraph (c) of Regulation 11 of this Chapter;

(vi) details of the maintenance of the batteries, including a record of the charging (if applicable) required by paragraph (j) of Regulation 13 of this Chapter, and details of the tests required by that paragraph in respect of the transmitters fitted in motor lifeboats;

(vii) details of the maintenance of the batteries, including a record of the charging (if applicable) required by paragraph (i) of Regulation 14 of this Chapter, and details of the tests required by that paragraph in respect of portable radio apparatus for survival craft;

(viii) the time at which the listening watch was discontinued in accordance with paragraph (d) of Regulation 6 of this Chapter, together with the reason and the time at which the listening watch was resumed.

(b) The radio log (diary of the radio service) required by the Radio Regulations for a ship which is fitted with a radiotelephone station in accordance with Regulation 4 of this Chapter shall be kept at the place where listening watch is maintained. Every qualified operator, and every master, officer or crew member carrying out a listening watch in accordance with Regulation 7 of this Chapter, shall enter in the log, with his name, the details of all incidents connected with the radio service which occur during his watch which may appear to be of importance to safety of life at sea. In addition, there shall be entered in the log:

(i) the details required by the Radio Regulations;

(ii) the time at which listening watch begins when the ship leaves port, and the time at which it ends when the ship reaches port;

(iii) the time at which listening watch is for any reason discontinued, together with the reason, and the time at which listening watch is resumed;

(iv) details of the maintenance of the batteries (if provided), including a record of the charging required by paragraph (l) of Regulation 16 of this Chapter;

(v) details of the maintenance of the batteries, including a record of the charging (if applicable) required by paragraph (i) of Regulation 14 of this Chapter, and details of the tests required by that paragraph in respect of portable radio apparatus for survival craft.

(c) Radio logs shall be available for inspection by the officers authorized by the Administration to make such inspection.

PARTIES TO THE SOLAS CONVENTION, 1974

(Under Instructions to Inspectors of Compulsorily Fitted Ship Station Radio Installations, Transport Canada TP-1896, December 1, 1981)

APPENDIX B-1

PARTIES TO THE SOLAS CONVENTION, 1974

	Date of signature or deposit of Instrument	Date of entry into force
Monaco (signature)	1 November 1974	25 May 1980
Ukrainian SSR (signature)	1 November 1974	"
India (accession)	16 June 1976	"
Norway (ratification)	15 February 1977	"
Mexico (acceptance)	28 March 1977	"
Tonga (accession)	12 April 1977	"
Cape Verde (accession)	28 April 1977	"
France (approval)	25 May 1977	"
United Kingdom (ratification)	7 October 1977	"
Liberia (ratification)	14 November 1977	"
Denmark (ratification)	8 March 1978	"
Panama (accession)	9 March 1978	"
Canada (accession)	8 May 1978	"
Sweden (acceptance)	7 July 1978	"
Netherlands (accession)	10 July 1978	"
Spain (ratification)	5 September 1978	"
United States (ratification)	7 September 1978	"
Trinidad and Tobago (accession)	15 February 1979	"
Bahamas (accession)	16 February 1979	"
Yemen (accession)	6 March 1979	"
German Democratic Republic (accession)	15 March 1979	"
Germany, Federal Republic of (ratification)	26 March 1979	"
Uruguay (accession)	30 April 1979	"
Israel (ratification)	15 May 1979	"
Romania (accession)	24 May 1979	"
Yugoslavia (approval)	11 June 1979	"
Kuwait (accession)	29 June 1979	"
Belgium (ratification)	24 September 1979	"
Peru (accession)	4 December 1979	"
Argentina (ratification)	5 December 1979	"

APPENDIX B-1 (continued)

	Date of signature or deposit of Instrument	Date of entry into force
China (ratification)	7 January 1980	25 May 1980
USSR (acceptance)	9 January 1980	"
Hungary (approval)	9 January 1980	"
Chile (ratification)	28 March 1980	"
Dominican Republic (accession)	10 April 1980	"
Greece (acceptance)	12 May 1980	"
Japan (accession)	15 May 1980	"
Brazil (accession)	22 May 1980	"
South Africa (accession)	23 May 1980	"
Italy (accession)	11 June 1980	11 September 1980
Turkey (accession)	31 July 1980	31 October 1981
Tunisia (accession)	6 August 1980	6 November 1980
Czechoslovakia (approval)	16 August 1980	18 November 1980
Colombia (accession)	31 October 1980	31 January 1981
Papua New Guinea (accession)	12 November 1980	12 February 1981
Finland (accession)	21 November 1980	21 February 1981
Qatar (accession)	22 December 1980	22 March 1981
Republic of Korea (ratification)	31 December 1980	31 March 1981
Maldives (accession)	14 January 1981	14 April 1981
Guinea (accession)	19 January 1981	19 April 1981
Indonesia (acceptance)	17 February 1981	17 May 1981
Singapore (accession)	16 March 1981	16 June 1981
Nigeria (accession)	7 May 1981	7 August 1981
Libyan Arab Jamahiriya (accession)	2 July 1981	2 October 1981
Egypt (ratification)	4 September 1981	4 December 1981
Switzerland (ratification)	1 October 1981	1 January 1982

APPENDIX C

RELEVANT EXTRACTS
FROM THE CANADA OIL AND
GAS DRILLING REGULATIONS,
OFFICE CONSOLIDATION
(NOVEMBER, 1980)
AND
THE CANADA OIL AND GAS
LANDS ADMINISTRATION
GUIDELINES TO OPERATORS
-EAST COAST (DECEMBER, 1983)

(EXCEPT WHERE IDENTIFIED, ALL
EXTRACTS ARE TAKEN FROM THE FIRST DOCUMENT)

C.1 EXTERNAL COMMUNICATIONS

C.1.1 Part I, Section 41, Subsection (2) Para (a) Subpara (i) and Para (b) Subpara (i) (iv) Pg. 16

(2) A drilling unit shall be equipped with an emergency electrical power supply system that is independent of the main source of electrical power for that drilling unit consisting of

(*a*) a prime mover and generator, located above the main deck at a location that is remote from the machinery housing, that is capable of supplying sufficient power for all systems including

(i) all navigational lighting and warning systems, emergency lighting, alarm and communication systems and fire extinguishing systems required by these Regulations in respect of the drilling unit, AND

(*b*) storage batteries capable of supplying sufficient power to operate for twenty-four continuous hours

(i) the marine radio required under the *Ship Station Radio Regulations* for transmitting or receiving on the distress frequency,

(iv) the lighting required by these Regulations in respect of communications and navigational control areas of the drilling unit.

C.1.2 Part I, Section 54, Subsection (1), (3) and (4) Pg. 22

54. (1) A radio or telephone communication system together with an emergency back-up system shall be installed and maintained in an operational condition at every site where drilling operations are being carried out.

(3) Every drilling unit shall be equipped with a radio communication system that includes

(*a*) a very high frequency marine radio telephone;

(*b*) a single side-band radio;

(*c*) a very high frequency aviation radio;

(*d*) a low frequency radio-homing beacon;

(*e*) a radio capable of communicating with any support craft used in connection with the drilling operations; and

(*f*) a facility for transmitting written data to and from the shore base.

(4) The operator shall comply with any law of Canada or any regulations made thereunder that is applicable to the licensing and operation of the radio communication equipment or system required by this section.

C.1. Part IV, Section 141 Pg. 54

(141) Every operator shall ensure that the radio station on a drilling unit used by him in a drilling program is manned with personnel capable of operating the radio station and such personnel shall, as a part of their regular duties,

(*a*) maintain a listening watch on the 156.8 MHz frequency; and

(*b*) monitor all movements of any support craft operating between the drilling unit and the shore.

C.1.4 Part IV, Section 142, Para (a) Pg. 54

142. Every person in charge of a standby craft referred to in section 18 shall

(*a*) maintain open communication channels with the drilling unit;

C.2 INTERNAL COMMUNICATIONS

C.2.1 Part I, Section 35, Subsection (4), Para (a), Subpara (iv) Pg. 13

(4) Where drilling operations are carried out offshore, the drilling unit shall be equipped with

(*a*) a medical treatment room that has

(iv) a connection with the internal telephone system.

C.2.2 Part I, Section 41, Subsection (2), Para (a), Subpara (i) Pg. 16

(2) A drilling unit shall be equipped with an emergency electrical power supply system that is independent of the main source of electrical power for that drilling unit consisting of

(*a*) a prime mover and generator, located above the main deck at a location that is remote from the machinery housing, that is capable of supplying sufficient power for all systems including

(i) all navigational lighting and warning systems, emergency lighting, alarm and communication systems and fire extinguishing systems required by these Regulations in respect of the drilling unit,

C.2.3 Part I, Section 54, Subsection (2) and (5), Pg. 22

(2) [redacted], a voice communication system shall be installed between every drilling rig and the accommodation area of the drill crew.

(5) Every drilling unit shall be equipped with

(*a*) an internal telephone system; and

(*b*) a public address system that has speakers placed in such locations that any transmission made by the system is audible to all personnel on the drilling unit.

C.3 OTHER COMMUNICATIONS

C.3.1 Part I, Section 59, Subsection (2), Para (a), Pg. 24

(2) Every diving vehicle referred to in subsection (1) shall be

(*a*) fitted with life support systems, observation ports, external lights, communications systems, a means of crossing the air-water interface in a safe manner and a means of guiding the diving vehicle to the diver's underwater work site; and

C.3.2 Part IV, Section 146, Subsection (5), Pg. 56

(5) A taped record of all voice communications between the diver and the diving supervisor shall be made during every diving operation referred to in subsection (1), except where the dive is to a depth of less than 55 m.

C.4 EMERGENCY COMMUNICATIONS (excerpt from COGLA Guidelines to Operators - East Coast, dated December 1983)

C.4.1 Part 2, Para (f), Subpara (i)

f) The lifesaving equipment on board each drilling unit shall include:

i) survival capsules or covered lifeboats of a capacity equal to 200 per cent of crew complement. In addition to the equipment normally carried, each is to be equipped with:

- a water resistant emergency radio to permit communications with rescue vessels, helicopters and drilling units;
- an emergency locater transmitter (EPIRB);
- a radar reflector.

APPENDIX D

RELEVANT EXTRACTS FROM THE
NEWFOUNDLAND AND LABRADOR PETROLEUM
DRILLING REGULATIONS 1982
AND
1984 WINTER DRILLING OPERATIONS ON
THE GRAND BANKS OF NEWFOUNDLAND

(EXCEPT WHERE IDENTIFIED, ALL EXTRACTS ARE TAKEN FROM THE FIRST DOCUMENT)

D.1 EXTERNAL COMMUNICATIONS

D.1.1 Part I, Section 17, Para (c), Subpara (vi) and Para (g) Pg. 11 and 12

17. Every operator shall ensure that

(c) the administrative and logistic support that is provided for in a drilling program includes the following:

(vi) the communication systems referred to in section 199;

(g) differences in language or other barriers to effective communication do not jeopardize the safety of operations on any drilling rig, drilling unit or support craft.

D.1.2 Part II, Section 199, Subsections (1), (2), and (3), Pg. 102

(1) A radio or telephone communication system together with an emergency back-up system shall be installed and maintained in an operational condition at every site where drilling operations are being carried out.

(2) Every drilling unit shall be equipped with a radio communication system that includes

(a) a marine radio telephone;

(b) a single side-band radio;

(c) a very high frequency aviation radio;

(d) a low frequency radio-homing beacon;

(e) a radio capable of communicating with any support craft used in connection with the drilling operations; and

(f) a facility for transmitting written data to and from the shore base.

(3) Every operator shall ensure that a log is kept recording the details of all radio transmissions and receptions and such a log shall be submitted to the Director on the request of the Director.

D.1.3 Part II, Section 208, Subsection (2), Para (a), Subpara (i) and Para (b), Subpara (i), Pg. 108

(2) A drilling unit shall be equipped with an emergency electrical power supply system that is independent of the main source of electrical power, for that drilling unit, consisting of

(a) a prime mover and generator, located above the main deck at a location that is remote from the machinery housing, that is capable of supplying sufficient power for all systems including

(i) all navigational lighting and warning systems, emergency lighting, alarm and communication systems and fire extinguishing systems required by these Regulations in respect of the drilling unit, and

(b) storage batteries capable of supplying sufficient power to operate for twenty-four continuous hours

(i) the marine radio.

Note: The Marine Radio is that which is required under any law for Canada or any regulation made thereunder for transmitting or receiving on the distress frequency. (From The Offshore Installations (Design, Construction and Survey) Regulations 1982, Section 13, Para (a), Subpara (ii), Pg. 30)

D.1.4 Part II, Section 209, Subsection (2), Para (a), Pg. 109

(2) emergency lighting shall be provided during the course of a drilling program to illuminate the following areas on a drilling rig that is onshore or on a drilling unit, namely,

(a) all communications centres;

D.1.5 Part II, Section 235, Pg. 121

235. Every operator shall ensure that the radio station on a drilling unit used by him in a drilling program is manned with personnel qualified to operate the radio station and such personnel shall, as a part of their regular duties,

(a) maintain a listening watch on the emergency frequencies; and

(b) monitor all movements of any support craft operating between the drilling unit and the shore.

D.1.6 Part II, Section 239, Para (a), Pg. 122

239. Every person in charge of a standby craft

(a) maintain open communication channels with the drilling unit;

D.1.7 (1984 Winter Drilling Operations on the Grand Banks of Newfoundland, Appendix I "Statement by the Hon. William Marshall on Winter Drilling - November 5, 1982) Pages 4 and 6 Sections 15 and 16

This assessment has now concluded. After weighing and considering all factors, conducting comprehensive studies, many meetings with the operators, consultations with experts in the field and after much and serious deliberation over the issue, Government has decided to permit drilling offshore during the winter months upon certain terms and conditions with which Government will require strict compliance. These terms and conditions are as follows:

(15) Communications with drilling units is to be improved with the status of rigs experiencing storm conditions to be reported to the operators' shore base at least every two hours. Also a recording device is to be installed in the radio room at that shore base to record communications with the rigs and store it for a period of 24 hours;

(16) Additional equipment, including permanent marine radios, head bolt heaters and radar reflectors, is to be installed in all life boats;

I.1.8 (1984 Winter Drilling Operations on the Grand Banks of Newfoundland, Appendix II "Requirements for Operators Proposing to Conduct Winter Drilling Operations on the Grand Banks of Newfoundland" Petroleum Directorate) Section 2.4, Pg. 5

2.4. Weather and Sea State Reporting

Operators must establish an appropriate communication system for real time weather and sea state information and data transfer among drilling units.

D1.9 (1984 Winter Drilling Operations on the Grand Banks of Newfoundland, Appendix II "Requirements for Operators Proposing to Conduct Winter Drilling Operations on the Grand Banks of Newfoundland" Petroleum Directorate) Section 6.0, Pg. 5

6.0 RECORDING OF DRILLING UNIT COMMUNICATIONS

Recording equipment must be installed at the operator's shore base, to record all HF communications with drilling units and support craft received and transmitted by the shore base. Recording of these communications, time indexed to facilitate retrieval of information, are to be kept for a period of at least 14 days. Specifications of the [illegible] equipment and a description of the communications to be [illegible] must be submitted to the Petroleum Directorate for approval.

D.1.10 (1984 Winter Drilling Operations on the Grand Banks of Newfoundland, Appendix II "Requirements for Operators Proposing to Conduct Winter Drilling Operations on the Grand Banks of Newfoundland" Petroleum Directorate) Section 9.2, Pgs. 10 & 11

9.2 Operating Requirements

Standby vessels must remain as close as practical to the drilling unit they are supporting. When weather and sea conditions make close proximity to the unit impractical, the distance from the unit can be increased but the standby vessel should be able to reach it within ten minutes.

It is difficult to establish inflexible rules concerning this safety operation and the distances and times mentioned above are intended to be guidelines. Should there be imminent danger to the unit, the captain of the standby vessel must be instructed to take a position in as close a proximity as possible to the drilling unit.

The standby vessel must maintain regular communication with the drilling unit under normal conditions and, during storm conditions, the standby vessel must be in frequent (i.e., at least hourly) communication with the drilling unit. Status reports must be given and logged during the communication.

D.2 INTERNAL COMMUNICATIONS

D.2.1 Part I, Section 17, Para (c), Subpara (vi), and Para (g) Pgs. 11 and 12

17. Every operator shall ensure that

c) the administrative and logistic support that is provided for in a drilling program includes the following:

(vi) the communication systems referred to in section 199;

(g) differences in language or other barriers to effective communication do not jeopardize the safety of operations on any drilling rig, drilling unit or support craft.

D.2.2 Part II, Section 199, Subsections (4) and (5) Pgs. 102 and 103

(4) a voice communication system shall be installed between every drilling rig and the accommodation area of the drill crew.

5 Every drilling unit shall be equipped with

(a) an internal telephone system; and

(b) a public address system that has speakers placed in such locations that any transmission made by the system can be made audible to all personnel on the drilling unit.

D.2.3 Part II, Section 208, Subsection (2), Para (a), Subpara (i) Pg. 108

(2) A drilling unit shall be equipped with an emergency electrical power supply system that is independent of the main source of electrical power, for that drilling unit, consisting of

(a) a prime mover and generator, located above the main deck at a location that is remote from the machinery housing, that is capable of supplying sufficient power for all systems including

(i) all navigational lighting and warning systems, emergency lighting, alarm and communication systems and fire extinguishing systems required by these Regulations in respect of the drilling unit,

D.3 OTHER COMMUNICATIONS

D.3.1 Part II, Section 246, Subsection (2), Para (a), Pg. 126

.. Every diving vehicle
shall be

(a) fitted with life support systems, observation ports, external lights, communications systems, a means of crossing the air-water interface in a safe manner and a means of guiding the diving vehicle to the diver's underwater work site; and

APPENDIX E

RELEVANT EXTRACTS FROM THE BRITISH OFFSHORE INSTALLATIONS (WELL CONTROL) REGULATIONS 1980

E.1 EXTERNAL COMMUNICATIONS

E.1.1 (Extract From The Offshore Installations (Emergency Procedures) Regulations 1976) Section 10, Subsection (2)

Stand-by services

10.—(1) There shall be present within 5 nautical miles of every offshore installation when it is manned a vessel (in these Regulations referred to as the "stand-by vessel") ready to give assistance in the event of an emergency on or near the installation and—

(*a*) which is capable of accommodating safely on board all persons who may be on the installation at any time; and

(*b*) which is equipped to provide first aid treatment for all such persons.

(2) Means for radio communication on appropriate wavelengths between every installation and its stand-by vessel shall be provided for at all times by suitable and effective equipment. Alternative means of communication shall also be provided on every installation and its stand-by vessel.

E.1.2 (Extract From The Offshore Installations (Operational Safety, Health, and Welfare) Regulations 1976) Section 18

Signalling equipment

18.—(1) Subject to paragraph (5) below, there shall be provided on every offshore installation such signalling equipment as will enable effective communication by radiotelephone, on appropriate channels, to be maintained between the installation and radio stations in the United Kingdom and between it and vessels, helicopters and other offshore installations.

(2) Any equipment provided under paragraph (1) above shall be installed in a separate building or room and provided with adequate facilities for the use of the operator of the equipment (in these Regulations referred to as "the radiotelephone operator").

(3) No building or room in which any equipment provided under paragraph (1) above is installed shall be in a hazardous area and any such building or room shall be so situated as to enable the radiotelephone operator when in the radiotelephone operating position either to have any helicopter landing area in full view or to speak to the helicopter landing officer when that person is in a position at which he has the area in full view.

(4) An instruction card giving a clear summary of the radiotelephone distress, emergency and safety procedures shall be displayed in full view of the radiotelephone operating position.

(5) Paragraph (1) above shall not apply in relation to any offshore installation which is not normally manned but, at any time when such an installation is manned, such signalling equipment shall be provided on it as will enable effective communication by radio to be maintained either between the installation and radio stations in the United Kingdom or between it and any other offshore installation which is provided with such equipment as is mentioned in paragraph (1) above.

APPENDIX F

RELEVANT EXTRACTS FROM
NORWEGIAN REGULATIONS
FOR
FIXED INSTALLATIONS
1982

F.1 EXTERNAL COMMUNICATIONS

F.1.1 Section 17, Pg. 77

Section 17

The drilling platform shall at all times be seaworthy and be provided with such equipment as is required for the safe operation of the platform, including the necessary nautical equipment, telecommunication systems for radio communication on both assigned and emergency frequencies with shore stations, helicopters, ships and other platforms in the area, position marking equipment, light and sound signals, life-saving equipment, fire-fighting equipment, pump for circulation of drilling mud in an emergency, first-aid equipment, etc.

F.1.2 Sections 93, 94, 95, 96, 97, 98, and 99. Pgs. 93 and 94

Section 93

The drilling platform shall be provided with the necessary equipment for radio communications.

Before any platform is put into service the above installations shall be approved by the Ministry or its authorized representative.

Inspection of the above installations shall be made whenever this is deemed necessary by the Ministry or its authorized representative.

Section 94

The equipment mentioned in section 93 above shall be permanently installed in a suitable radio room so that it will not be damaged or displaced by sudden movements of the platform.

Section 95

The radio installation shall operate only on approved frequencies and at the approved power output, and in compliance with the conditions laid down in the radio communications licence issued for the said installation. It must be maintained and operated in accordance with the international conventions in force at any time to which Norway is a party and in accordance with Norwegian laws and regulations in force at any time.

Broadcasting (sound and television) from the platform is prohibited.

Section 96

The radio installation shall be operated by a radio operator holding an approved certificate in accordance with the regulations in force.

Section 97

When the drilling platform is being raised or lowered, cf. section 22, and during other operations which involve particular danger, such as helicopter landing/take-off, the mooring of vessels, etc., the radio station shall be ready for use, manned by a radio operator.

Section 98

The radio installations mentioned in section 93 shall provide the necessary connections with approved stations on shore, on ships and helicopters and on other drilling platforms in the area.

The platform shall be provided with a sufficient number of approved, portable radio apparatus for lifeboats and other survival craft.

Section 99

In addition to the regulations in this chapter, the legislation in force at any time regarding telecommunications installations and their operation, will be applicable.

F.1.3 Section 104, Pgs. 94 and 95

Section 104

Helicopters serving drilling platforms shall be constructed, equipped, manned and kept in repair in accordance with the regulations in force at any time

Helicopters shall be of such a type and capacity that they can serve the drilling platform in a safe and satisfactory manner. Helicopters shall be designed or be provided with equipment to enable them to alight on the sea. They shall be provided with the necessary lifesaving equipment, lifesaving hoist, equipment for fire-fighting, first-aid, navigation and communications in accordance with the regulations in force and the approved operations manual

An operating licence will be required for flying to and from drilling platforms

F.1.4 Section 2.2.12. Pg. 305

2212 Communication

The operating cabin on the crane used for the loading or unloading of supply vessels shall be equipped with a communication system, enabling the crane operator to be in continous contact with the supply vessel and the signal man on deck. The system shall be arranged so that the crane operator can communicate without using his hands

F.1.5 Section 13.2 and 13.3. Pg. 352

13.2 Definition

Emergency power system is defined as the total system necessary to ensure the following consumers continous emergency power.

- Emergency lights
- Gas detection system(s)
- Fire detection-/fire fighting system(s)
- Alarm- and communication systems
- Emergency shut-down system(s)
- Platform evacuation system(s)
- Other vital equipment.

The emergency power system shall be designed to operate independently from any other system.

13.3 Capacity, intergration and location

The emergency power system shall be able to supply its consumers for a period of at least 24 hours

13.3.2 Emergency power to all the consumers listed in 13.2 shall be intergrated in the normal operating power system in such a way that loss of main power results in automatic transfer to emergency power («no break» system).

13.3.3 Equipment for the emergency power supply shall be suitably located, preferably in separate rooms

F.1.6 Section 13.4.7. Pg. 353

13.4.7 The emergency power for the Radioroom shall be in accordance with the Regulations of the Telecommunications Administration

F.1.7 Section 5.3. Pg. 384

5.3 *Radio communication*
Direct and continous radio communication shall be maintained between the person in charge on the start and landing area respectively, and the craneoperator, from the time prior to use of the personnel basket until the completion of the transfer.

F.1.8 Section 4.9.5. Pg. 421-422

4.9.5 Radio equipment and other equipment which may constitute a hazard to the firing operations shall not be used while such operations are in progress. The same applies to radio equipment onboard vessels or helicopters which are not at a safe distance from the platform.
Neither shall any other activities take place which may represent a similar hazard.

F.2 INTERNAL COMMUNICATIONS

F.2.1 Section 2.2.12. Pg. 305

2.2.12 Communication
The operating cabin on the crane used for the loading or unloading of supply vessels shall be equipped with a communication system, enabling the crane operator to be in continous contact with the supply vessel and the signal man on deck. The system shall be arranged so that the crane operator can communicate without using his hands.

13.2 Definition

Emergency power system is defined as the total system necessary to ensure the following consumers continous emergency power.

- Emergency lights
- Gas detection system(s)
- Fire detection-/fire fighting system(s)
- Alarm- and communication systems
- Emergency shut-down system(s)
- Platform evacuation system(s)
- Other vital equipment.

The emergency power system shall be designed to operate independently from any other system.

13.3 Capacity, intergration and location

The emergency power system shall be able to supply its consumers for a period of at least 24 hours

13.3.2 Emergency power to all the consumers listed in 13.2 shall be intergrated in the normal operating power system in such a way that loss of main power results in automatic transfer to emergency power («no break» system)

13.3.3 Equipment for the emergency power supply shall be suitably located, preferably in separate rooms

F.2.3 Section 14.2. Pg. 355

14.2 **Internal communication systems**

14.2.1 The installation shall be equipped with internal communication system which will ensure that messages can be sent to and from areas.
Normally this means that the production installation shall be equipped with emergency telephone, walki-talkies and a public address system.

14.2.2 The public address system is to be operable from strategic places such as control centre, radio room and drill floor, so that personnel may be warned about hazardous situations etc.

14.2.3 Prior to all important messages like: «Stop all work» and «Man overboard», a short alerting signal should be sounded over the public address system, to attract attention. The control centre shall have priority to operate the public address system.

14.2.4 In areas with a high noise level a flashing light shall alert personnel that urgent messages are to be announced over the public address system.

F.2.4 Section 5.3. Pg. 384

5.3 Radio communication
Direct and continous radio communication shall be maintained between the person in charge on the start and landing area respectively, and the craneoperator, from the time prior to use of the personnel basket until the completion of the transfer.

F.2.5 Section 4.9.5. Pgs. 421-422

4.9.5 Radio equipment and other equipment which may constitute a hazard to the firing operations shall not be used while such operations are in progress. The same applies to radio equipment onboard vessels or helicopters which are not at a safe distance from the platform.
Neither shall any other activities take place which may represent a similar hazard.

APPENDIX G

RELEVANT EXTRACTS FROM
OFFSHORE DRILLING REGULATIONS
MINISTER FOR GREENLAND
APRIL 1977

G.1 EXTERNAL COMMUNICATIONS

G.1.1 Chapter 4, Article 1.02. Pg. 4-2

1.02 The drilling platform shall at all times during drilling and during moves be provided with such equipment as is required for the safe operation of the drilling platform such as nautical equipment, emergency power supply, position-marking equipment, sound and light signals, life-saving equipment, fire-fighting equipment, first-aid equipment, telecommunications equipment and equipment for internal communications.

G.1.2 Chapter 4, Article 7.06. Pg. 4-8

7.06 The drilling platform shall be equipped with a pick-up boat of an approved type with a motor. The boat shall be of a type that can be launched quickly, shall be easily nanoeuvrable, and shall be designed to permit the rapid recovery of anyone who has fallen overboard. The pick-up boat shall at all times be ready for instant use and shall be served by a winch that allows rapid lowering and raising. The pick-up boat shall have a radio permanently installed in it to permit communication with the drilling platform during rescue operations.

G.1.3 Chapter 8, Article 9.03. Pg. 8-6

9.03 The emergency power supply shall have sufficient capacity to supply simultaneously electrical installations which operate the sound and light signals, the warning and alarm systems, fire-fighting equipment, navigation equipment, communication equipment, elevators, diving equipment, emergency lighting in areas as specified in subarticle 9.04 and equipment for determining the position relative to the well. The emergency power supply shall be led through a separate wiring system, which is installed outside areas where the fire risk is great, e.g. the engine rooms and galleys.

3.1.4 Chapter 8, Article 10.01, Pg. 8-6

10.01 The drilling platform shall be supplied with an emergency battery system with sufficient capacity to provide 2 hours' continuous supply of current to the alarm and communication system, lights along evacuation routes, the helicopter deck and rescue stations and shall have an emergency battery system with adequate capacity to supply current for 5 days continuously to the sound and the light signals.

3.1.5 Chapter 12, Articles 1, 2, and 3. Pgs 12-2 and 12-4

Article 1

1.01 The drilling platform shall have the necessary installations and equipment for telecommunications in accordance with the regulations in force at the time in question.

1.02 Before drilling starts the telecommunications installations and equipment and the power output and frequencies used shall be approved by the Ministry for Greenland or anyone authorized by the Ministry.

1.03 The telecommunications installations and equipment shall enable communication to take place with Greenland coastal and air stations, with ships and aircraft participating in drilling operations, and with other drilling platforms in the area. It shall also be possible to receive weather forecasts etc.

Article 2

2.o1 The telecommunications installations and equipment shall be designed and placed in such a manner that the risk of damage and interruption of communications during the drilling period at the drilling site is minimized. In designing and placing the installations and equipment due regard shall be taken to the requirements in force at the time in question for the operation of telecommunications installations and equipment.

2.o2 Transmitters and receivers shall be installed in a suitably designed and placed radio room and shall be adequately secured so that they are not destroyed or put out of operation by movements of the drilling platform.

2.o3 The radio room mentioned in subarticle 2.o2 shall have easy access to the open deck.

Article 3

3.o1 All covered survival craft on the drilling platform and the pick-up boat mentioned in chapter 4, subarticle 7.o6 shall be provided with radio equipment which can be accepted by the Ministry for Greenland or anyone authorized by the Ministry.

..1.6 Chapter 23, Article 6.02. Pg. 23-4

6.02 If the radio equipment or other equipment on the drilling platform or equipment on ships in the vicinity of the drilling platform can endanger work with explosives or perforating work the equipment shall not be used while such work is being undertaken. In such a case measures shall also be taken to ensure that the particular equipment cannot be switched on accidentally as long as the work is in progress. In addition, it shall be ensured that there are no helicopters near the drilling platform while the work is in progress.

..1.7 Chapter 25, Articles 1, 2, and 3. Pg. 25-2

Article 1

1.01 The telecommunications installations and equipment on the drilling platform shall be maintained, operated and manned in accordance with the regulations in force at the time in question.

1.02 The radio equipment shall only be used with the frequencies allocated and with approved power output and shall be used in complete accordance with the conditions contained in the permit issued for the installations.

1.03 Broadcasting (sound and television) from the drilling platform is prohibited.

Article 2

2.01 The radio installation shall be operated by a radio operator whose qualifications can be accepted by the Ministry for Greenland or anyone authorized by the Ministry.

Article 3

3.01 During operations creating special danger such as landing and take-off of helicopters or mooring of vessels, the radio station shall be ready for use and manned in accordance with the regulations in force.

G.2 INTERNAL COMMUNICATIONS

G.2.1 Chapter 4, Article 1.02, Pg. 4-2

1.02 The drilling platform shall at all times during drilling and during moves be provided with such equipment as is required for the safe operation of the drilling platform such as nautical equipment, emergency power supply, position-marking equipment, sound and light signals, life-saving equipment, fire-fighting equipment, first-aid equipment, telecommunications equipment and equipment for internal communications.

G.2.2 Chapter 8, Article 9.03, Pg. 8-6

9.03 The emergency power supply shall have sufficient capacity to supply simultaneously electrical installations which operate the sound and light signals, the warning and alarm systems, fire-fighting equipment, navigation equipment, communication equipment, elevators, diving equipment, emergency lighting in areas as specified in subarticle 9.04 and equipment for determining the position relative to the well. The emergency power supply shall be led through a separate wiring system, which is installed outside areas where the fire risk is great, e.g. the engine rooms and galleys.

G.2.3 Chapter 8, Article 10.01, Pg. 8-6

10.01 The drilling platform shall be supplied with an emergency battery system with sufficient capacity to provide 2 hours' continuous supply of current to the alarm and communication system, lights along evacuation routes, the helicopter deck and rescue stations and shall have an emergency battery system with adequate capacity to supply current for 5 days continuously to the sound and the light signals.

G.2.4 Chapter 12, Articles 4 and 5. Pg. 12-4

Article 4

4.o1 The drilling platform shall be provided with equipment for internal communication between the various parts of the drilling platform.

Article 5

5.o1 The drilling platform shall be provided with an internal alarm system which can be activated from suitable places on the drilling platform.

5.o2 The alarm system shall be able to alarm all on board by means of suitably placed sound and light sources.

G.2.5 Chapter 23, Article 6.02, Pg. 23-4

6.o2 If the radio equipment or other equipment on the drilling platform or equipment on ships in the vicinity of the drilling platform can endanger work with explosives or perforating work the equipment shall not be used while such work is being undertaken. In such a case measures shall also be taken to ensure that the particular equipment cannot be switched on accidentally as long as the work is in progress. In addition, it shall be ensured that there are no helicopters near the drilling platform while the work is in progress.